SCREW PROPELLERS (Illus.). *See p.* 464.
ARBITRATION ON WAR OR MARINE LOSS. *See p.* 461.

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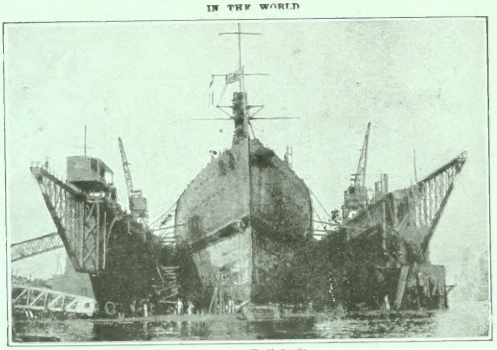

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SEVERAL Government departments are giving consideration to the subject of a Mid-Scotland Canal connecting the Clyde and the Forth. The various aspects of the subject seem to be focussed in the Ministry of Reconstruction, but no decision has been come to. The Admiralty has an important voice, because the strategical value of the undertaking is a matter for the Navy to consider. We have often heard the argument that a Forth and Clyde canal would place the shipbuilding resources of the Clyde at the disposal of Rosyth in an infinitely greater measure than at present. The commercial aspect of the project comes within the purview of the Board of Trade. When this subject was raised before the Royal Commission on Canals some years ago the practical question was put, whether it was possible to construct a canal which could offer to shipowners low enough tolls to induce them to send their vessels through it, rather than round the North of Scotland. That point would not so strongly arise if the Admiralty pressed for its construction on strategical grounds. The questions of the choice of routes and of expense have also to be examined. Of course, if it were decided to go on with the canal it would be wise to be prepared to proceed with the construction on the immediate demobilisation of the Army. It is understood that the Ministry of Reconstruction is giving its attention to the improvement of inland waterways generally.

Mid-Scotland Canal.

A fear was recently expressed that, as a result of the entry of the United States into the war, the supply of steel from the States to Japan would of necessity be considerably reduced, and that it would, in consequence, be impossible to maintain the shipbuilding programme at the rate originally intended. It will be recalled that the original programme outlined the construction of ships aggregating 300,000 tons during the fiscal year ending April, 1918, and that the launchings to date showed that this figure would almost certainly be reached. The shipbuilding material existing in the country was expected to last until next June, after which the problem of supplies would possibly have become sufficiently acute to retard the rate of shipbuilding. All fears as to the future have, however, been set at rest by an agreement reached between the United States and Japan, whereby Japan is to receive steel plates from the United States in sufficient quantities to carry out her shipbuilding programme, both naval and mercantile. In return for this, Japan is to furnish a large amount of tonnage for American needs, and to extend the scope of her co-operation in the warfare against submarines.

Japanese Shipbuilding Activity.

We have frequently drawn attention to the negotiations which have been going on between the Port of London Authority on the one hand, and other bodies desirous of constructing deep-water wharves on the banks of the Thames. We chronicled the fact that the application made for powers to construct wharves at Gravesend was refused by the Port of London Authority on the ground that the scheme "would be objectionable from the point of view of navigation." In a letter to Mr. H. W. Towse, the engineer for the scheme for constructing deep-water wharves at Canvey Island, twelve miles below Tilbury, the secretary of the Port of London Authority states that "the decision of the Authority was that the application be declined on the ground that the accommodation applied for is of the character of that which Parliament has charged the Authority with the duty of providing in the Port." In neither of the two cases quoted does the Authority show any objection to the principle of deep-water wharves, but in the letter quoted above, it suggests that the duty of providing such accommodation rests with it alone. We do not quarrel with this suggestion, but in view of the fact that any scheme which would tend towards the development of the Port of London, and also because certain high authorities have predicted a most useful future for this class of accommodation for merchant vessels, it should not be sufficient to shelve the matter in this way. The Port of London Authority should make a statement giving their attitude towards the question of the provision of facilities of this nature.

Deep-Water Wharves for the Thames.

It is not so very long ago that we referred in these columns to the danger underwriters ran in writing building risks where the interest was situated in some of the newer American yards. We believe our warning to have been justified by results, heavy claims from various accidents having accrued in not a few cases. Recent advices show a further development in this matter. Although the builders of sailing vessels in the older American yards can turn out eminently satisfactory work both as regards design and craftsmanship, it would appear that some of the newer departures are not showing such satisfactory results in either of these categories. Heavy claims and some total losses for missing vessels have already been notified on some of the risks to which we refer, and although such mishaps are not confined to badly-constructed vessels only, there is little doubt that some of the recent losses are undoubtedly the result of inefficient workmanship. We would be far from asserting that all new American yards are turning out bad ships; some of them, we

New American Sailing Vessels and Insurance.

know, can compete on level terms with their older rivals, but careful discrimination, based on records which are now available, is desirable when risks of this nature are being shown in the market.

Renewal of Time Risks.

Last week, when writing of the February insurance renewals, we alluded to instances where a rise in premium over and above the usual 10 per cent. has been obtained by underwriters. It is of interest to examine two such cases which have recently been showing in the market. The first is a vessel of some age, which last year was insured, together with a considerably younger steamer. This year she is being placed alone, her sister ship having been sold. Naturally, the exclusion of the newer vessel has acted adversely on the premium of her old sister, and where last year a rate of 16 guineas per cent. was charged, this year the rate for renewal is 20 guineas per cent. The second case is that of a steamer insured alone both last year and this. Her record for some years past has been far from good, and underwriters have asked for and obtained a rise of 3 guineas per cent., the rate for the new insurances being 15 guineas per cent. An alternative risk is mentioned on the ship, however, and should the owner choose, he can place his insurances at the old rate with the inclusion of the Jansen clause which provides for the first 3 per cent. of each claim being borne by the assured.

Insured Values and Sue and Labour Charges.

The action brought by the owners of the steamer *Florence* against the underwriters, which was decided at Liverpool Assizes last week, settles a novel and important point in insurance law. Apart from other complications, the action was to decide whether sue and labour charges were to be adjusted on the insured value or on the actual value of the vessel, which is to say, shall the underwriters pay the whole of the charges, or (in the event of the vessel being valued for insurance at less than her estimated value) shall the owners bear their proportion of the expenses. The point does not appear to have been raised before, and Mr. Justice Shearman's decision, which was adverse to the underwriters, will not be welcome to that community, though they do not dispute its legality. The fact remains, however, that whereas, when estimated and insured values were approximate, sue and labour charges were of no very great account, under present conditions when insured values are generally well below real values these charges can amount to a very serious item when adjusted on the lesser valuation. The case under discussion is an excellent example of this, for, on the *Florence's* insured value of £5,205, the sue and labour charges of £4,500 alone amount to a claim of about 90 per cent. The case presents other interesting features, for the discussion of which we have no space in these columns, but it is noteworthy that the question of general average was obscured by the apparent disappearance of the cargo, which, after being dispatched by rail, could be traced no further, though evidence to the effect that it was practically worthless was given. Had it been realisable, even for a minute sum, the charges would have been adjustable as general average, which makes it all the more difficult to understand why the vessel should not contribute its proportion to the expenses.

The Case of the Liner.

In view of the probability that in the near future sufficient steel will be available to meet the requirements of the Government's full merchant shipbuilding programme, the liner companies should, we think, press their claim to be allowed to build vessels more suitable to their trade than the proposed State standardised ships. There is no sound reason, even from the Government's point of view, why they should not be free to do so, for their ships will not take longer to build than the standardised ships; their construction will not absorb more labour nor call for more steel; and, ton for ton, they will carry as much deadweight cargo and more measurement cargo. None of the arguments used against allowing cargo-vessel owners to order their own kinds of ships therefore applies. The position of the liner is, in fact, one of exceptional strength, and it will be a great mistake if they neglect to make the most of it. Much has been said of late about the immense service which the lines have given to the Allied cause during the war, and about the obligation which it places upon the State to act more generously towards them than it is acting. That we put a very high value on that service goes without saying. We submit, however, that, at any rate, as good a claim to consideration can be rested on the liner's record in building up seaborne trade before the war. The history of practically every important company is a narrative of splendid enterprise and steady progress without State-aid of any kind—very often, as a matter of fact, in spite of the State's discouragement. It is across that progress that the Government's present shipping and shipbuilding policy cuts, and it is time that the fact was realised in high places.

Requisitions and Time Charters.

Shipowners have experienced within the last two or three years very many instances of the Admiralty taking over by requisition, ships running under time charter. Some time ago two of the judges of the King's Bench Division gave separate judgments in the case of the Countess of Warwick Steamship Company, Ltd., *v.* Le Nickel Société Anonyme, and the Anglo-Northern Trading Company *v.* Emlyn, Jones & Williams, in which the doctrine of frustration of the adventure was successfully invoked to bring an end to the charter of a ship under requisition. The Court of Appeal has upheld these judgments. The fact that a vessel is taken on requisition is not enough in itself to terminate a charter. The point which the Courts look at is the probable length of the total deprivation of the use of the vessel as compared with the unexpired duration of the charter party. If the charterer can show that in the estimate of reasonable men of business the withdrawal will defeat the purposes of the charter entirely, then the latter comes to an end. On this finding, of course, the charterer would not be liable for hire.

The Windjammer's Opportunity.

The abnormally high price of tonnage is having the result of restoring to service many old sailing vessels whose usefulness at sea had, it was thought, been ended years ago. Numerous instances of this revival might easily be given, but, perhaps, most interest attaches to several "windjammers" that in their day were very much in the public mind. For instance, three former well-known units of the famous Glasgow Loch Line of clippers—the *Loch Ness*, *Loch Tay*, and *Loch Katrine*—who for a number of years have been doing duty as coal hulks in Australian waters, are now, we hear, being fitted out for the overseas routes. In addition there are the *Macquarie*, now the *Fortuna*, the *Concordia*, and the *County of Caithness*, which will also most likely be seen again at British ports. The American Shipping Board is not, however, favourably disposed towards the employment of sailing ships in the war zone. It has, in fact, decided to refuse licences for them, as it is believed that by releasing steamers they would be of much greater use in the coastal trade. The schooner *America*, which "lifted" the cup for the New York Yacht Club in 1851, has already been placed in that service, for which the *Success*, a ship that was built in Burmah as far back as 1790, is also being prepared. Between 1829 and 1852 the latter vessel was engaged in carrying emigrants and convicts from this country to Australia, and in the latter year was transformed into a prison ship at Melbourne. Ultimately, she was bought by Americans for exhibition purposes, and her hull is said to be as good as it was when she flew the old East India Company's flag.

Conditions on Passengers' Tickets.

We should have thought that the law respecting conditions on passengers' tickets was so plainly laid down that there was no need to have recourse to the Courts to declare it. The Anchor Line, however, has been successfully resisting a claim in the Scottish Courts which has brought the subject under review there. A first-class ticket was issued to a passenger travelling from New York to Glasgow. It was plainly printed on the ticket and on its envelope that the shipowner was not to be liable to a passenger for injury beyond a sum of £10. The vessel in which the passenger crossed the Atlantic grounded, and in the course of being transferred to another steamer he sustained certain injuries. He sued for a considerable sum as damages, but the shipowner contended that by the conditions printed on the ticket his liability was limited to £10. The Lord Ordinary decided in favour of the Anchor Line, and now the Second Division of the Court of Session or Appellate Court has upheld that decision. In England the law regarding conditions on passengers' tickets was settled a long time ago in connection with railways, but the principle of contract is precisely the same in respect to shipping. A condition clearly printed on a ticket is really an offer to carry a person on certain terms, and if he accepts the ticket and travels on it he is bound by all the conditions of the contract of which it is a record. It lies with the passenger to make himself acquainted with conditions, which are easily apparent.

Munitions Ministry and Labour.

Since the outbreak of war, shipbuilding and engineering employers have had very little to say publicly about the methods of the authorities which are controlling their industries, preferring to express whatever opinions they held through their federations and associations. As they know their own business best, we hesitate to put forward any views of our own as to whether that policy is sound or otherwise. We feel bound to say, however, that in some circumstances it seems to us to be to take a large risk to leave public opinion to focus itself on inadequate knowledge of the facts. The 12½ per cent. bonus is a case in point. The first Order on the subject issued by the Ministry of Munitions applied only to skilled time-workers doing a particular kind of work, and it was a mistake, as is now perfectly clear, to extend the concessions to any other class. We offer no opinion as to whether the subsequent orders were good or bad. The point is that the Ministry of Munitions seems to be in possession of powers which, if the organisation of our war industries is to be efficient, should be in the hands of the Ministry of Labour's Committee on Production. The Ministry of Munitions ought not to have authority to deal with differences of this sort which, if they arose between employers and the trade unions, would be referred by them to the Committee on Production. Much the same may be said regarding the activities of the Shipyard Labour Department, whose powers, like those of the Ministry of Munitions, overlap with others. Far more use could be made of the Committee on Production than is made, and the public ought to be told so.

Standardised Shipbuilding.

Now that the majority of the United Kingdom's yards are, on the First Lord's showing, building standardised ships, one or two interesting points arise. It is highly probable—in some quarters it is regarded as absolutely certain—that there will be a large resort to standardised shipbuilding and marine engine construction after the war. A moot point is, however, whether firms will adhere to the State designs or standardise on the basis of other designs—their own, for example. The steelmaker is obviously interested in that phase of the question, and until his views are known it would clearly be unwise to offer a definite opinion on it. Of more immediate importance is the question of how far the State's standardised ship policy is to go. For instance, is the programme to be carried through to its conclusion, regardless of when the war ends? It seems to be certain that at the moment the conflict ceases there will be a considerable number of standardised vessels in progress or definitely on order. Without knowing very much about the designs of the ships, the average man, giving rein to his imagination, may not unreasonably ask whether the plans are to be carried out as they stand, or whether there are to be modifications to bring the vessels into line with peace conditions. If the answer is that at the suitable moment modifications are to be made, a new question arises. When the suitable moment arrives, will shipbuilders be given permission, as far as possible, to standardise the construction of ships of their own design? The danger is—and how real it is only shipbuilders appear to appreciate—that State control of shipbuilding may, through shortsightedness, be seriously overdone.

Skill in Ship Design.

The proper design of merchant ships must take account of the needs of owners and the methods of construction as they affect the shipbuilder. The commercial element must be a prominent factor and must embrace the financial interests of the shipbuilder and the shipowner. Not only so, but these interests must not injuriously affect the interests of the shipper who entrusts his property on the vessel, and the interests of the underwriter who insures the shipper and shipowner. The rules of the societies, representing all the interests involved, narrow the field in which a naval architect may exercise his skill. Yet, in spite of these restrictions, the progressive shipbuilder is continually forcing the recognition by the registration societies of new methods in construction and new features of design. It is fortunate that, at the head of the registration societies such as Lloyd's and the British Corporation, there are capable men keen on advancing new methods of construction. New designs submitted are judged on their merits, and the result is that whilst the standard of strength is being maintained, economy in weight of structure and in cost of construction is being effected. At the present time, the need of ships of all kinds is pressing, and the skill of designers has evolved vessels differing in design and construction from former practice, which will help in the acceleration of production and the maintenance of sea power.

Assistant Pistons in Marine Engines.

The fitting of assistant or balance pistons to the valve spindle of reciprocating steam engines carrying heavy slide valves has been the means of reducing considerably the wear and tear of the bearing surfaces of the valve gear. The forces acting on these surfaces are those due to weight of the parts themselves, plus the dynamical loads set up due to gradual acceleration and retardation of the masses during each stroke of valve. The best type of piston to fit will depend on the relative magnitude of the gravitational and dynamical loads to be overcome. With slow-running engines, the dynamical forces are generally a small proportion of the total load, and it is sufficient in this case to balance the weights only, by means of a simple piston, the under-side of which is open to the pressure of steam in the valve chest and the upper to the vacuum, a pipe connection being led to the condenser. With high-revolution engines, however, the inertia forces play a greater part, and it is desirable to balance, as far as is possible, these forces. This may be accomplished by the fitting of the well-known "Joy" or other similar type of piston in which the steam from the valve chest may be admitted through ports to either the top or bottom side of piston as required, the piston load in this case is made equal to that necessary for acceleration or retardation of the parts, and thus relieves the eccentric sheaves and pins of these forces.

FREIGHT AND ABANDONMENT.

THE principles on which the payment of freight is based are well understood. They have been established by legal decisions. In the recent case of H. Newsum, Sons & Co., Ltd. *v.* Bradley and others, we see some of those principles illustrated, and in one respect at least, applied to circumstances of an unusual, if not quite unprecedented character. We mean the abandonment of a vessel under enemy duress, and its subsequent recovery by patrols of the Navy. On the vessel being brought into a port not being her port of destination, the Court of Appeal, by a majority of two to one, decided that the owners of the cargo were entitled to claim to take delivery there free of freight, the shipowners in the meantime having informed them that the vessel had been sunk.

We can quite imagine similar instances occurring in the course of the war. This case is quite worth detailed examination. The vessel, the *Jupiter*, was on a voyage from Archangel to Hull with a cargo of wood, when off the coast of Scotland an enemy submarine was encountered. The crew were compelled, under threats of violence, to take to their boats, and the enemy placed bombs in the vessel. These exploded, and when the crew last saw her they believed her to be sinking. They reported the vessel sunk, and this intelligence was communicated to the cargo owners. As a matter of fact, the cargo of wood kept the vessel afloat, and patrols of the Navy towed her—a water-logged derelict—into the Forth, and beached her near Leith, where she was handed over to the Receiver of Wrecks. The cargo owners intimated to this official that they elected to take possession of the cargo where it lay. By arrangement between the parties, and without prejudice to existing rights, the vessel was subsequently taken to Hull, and she delivered her cargo there. The cargo owners in their action claimed a declaration that they were entitled to take delivery of the cargo at Leith, free of freight. This declaration has been given by the Courts.

Freight at common law is not due until it is earned, and nothing short of complete performance of the contract entitles the shipowner to receive it. Of course, this rule of the law may be modified by express stipulation, but the bills of lading in the case under review provided for the delivery of the cargo in Hull on payment of freight. The contract was to carry the goods to Hull.

Another rule follows naturally from the principle we have just cited. After a ship and cargo have been abandoned at sea by the master and crew, the owner of the cargo is entitled to treat the contract of carriage at an end, and, in case the derelict vessel is picked up and brought into port, to obtain possession of the cargo from the salvors without paying freight. The question was whether the circumstances of an abandonment under enemy duress admitted of an exception. The majority of the judges applied the rule without modification in the present case. Their decision rested on the ground that the shipowner had, in fact, abandoned further performance of his contract before the vessel reached Leith. By communication of the news that the vessel had been sunk, the shipowner had intimated that he was not in a position to complete the voyage and nothing was done to resume possession of the cargo. They did not recognise a distinction between the case of a vessel abandoned under duress of the enemy and one abandoned under stress of weather.

This distinction, however, recommended itself to the dissentient judge in the Court of Appeal, Mr. Justice Sargant. Perhaps his ideas were influenced by the notion that the vessel was to be regarded rather as a prize abandoned by the enemy, than as an ordinary derelict. At any rate, he saw two different sets of motives at work—in the case of abandonment under stress of weather, the impossibility of bringing the ship to its destination, and in that under enemy duress, the desire of the crew to secure their personal safety. We are not sure that we quite follow the analyses. We see what he meant when he said that their act in saving their lives should not be deemed to show an intention on the part of the shipowner to abandon the contract. Nor was he prepared to read any like intention into the statement made in all good faith about the sinking. We are bound to accept the decision of the majority of the judges as the accurate view of the law, but if we regard the case as an enemy capture and a subsequent recovery, we cannot refrain from a measure of sympathy with Mr. Justice Sargant's opinion that the restoration of the property should, in such an instance, carry with it a restoration of the reciprocal rights and obligations under the contract of carriage.

LABOUR AND CAPITAL.

IT is probably quite true to say that never before in the history of British industry has there been so much to read as there is to-day about the relations of Capital and Labour. Labour's contributions to the periodical and other literature of this kind is abnormally heavy. National Guildsmen, Plebs, and Industrial Unionists being apparently most strongly represented. Except on the question of amalgamation, Craft Unionists—Craft Unionists in principle that is, as well as Craft Unionists in practice—have neither more nor less to say than usual, continual negotiations with the powers that be under the war's emergency legislation very likely leaving them with little time to spare for bigger things. One or two individual employers—Sir Robert Hadfield for example, Dr. G. B. Hunter, and Mr. J. R. Richmond—have made notable contributions. So far no organised body of employers—no body of employers, that is, engaged in the same important industry—has publicly expressed its views ; that is not, however, to be wondered at in view of the reticence officially maintained by the organisations of the other side. When he comes to analyse the literature which has been published on the subject, the reader will be surprised to find that, leaving out of account the people whose aim frankly is to revolutionise industry, politicians and other public men are the great majority of its contributors.

We do not seek to deny that public men have a perfect right to take an interest in the matter and to express opinions on the many very delicate problems involved. The majority of them are, it is true, not very intimately acquainted with the industry, and their undoubted sympathy—sympathy with employers as well as with employees—does not convincingly compensate their comparative ignorance. But they unquestionably mean well, and they are sincere in their proposals for improving the relations of Capital and Labour. Reasonable men on both sides gladly concede as much, and welcome the co-operation which is offered, limited though it necessarily must be.

The danger is—and it would be folly not frankly to recognise it—that seeing so much in periodicals and other publications about improving the relationship of Capital and Labour, the public may gather the impression that masters and men are getting into closer touch with each other, are more sympathetically regarding each other's difficult position, and are getting ready to co-operate in the increase of production which the post-war period will call for. Closer touch, greater sympathy, and a larger degree of co-operation are consummations devoutly to be wished. Unfortunately, there is not a solitary sign of them anywhere in British industry. Knowing that employers are, as a rule, business men and not visionaries, the general public correctly enough assumes that they are not the stumbling blocks to improved relations.

The stumbling blocks are held to be the trade unions whose opinions are said to be those which the various sections of the Rank and File are expressing. Inquirers will act wisely if they halt here just for a moment in order to examine this point. What grounds are there for believing that the Rank and File and the duly constituted authority of Trade Unionism think alike? No section of the Rank and File has said so ; on the contrary, the whole movement has more than once demonstrated that it has the lightest possible regard for constituted authority. Nor has duly constituted authority in the shape of an executive council ever said

so. It is open, of course, to an objector to deny that—the obvious conclusion from that is the right one. It may be argued that the mere fact that an executive council has not publicly declared views similar to those of the Rank and File does not prove that it does not hold these views. The idea behind the reticence may be to allow the Rank and File to make the running and then to profit by their experience.

We do not deny the possibility, for the average executive council long ago gave up the habit of trying to lead. But, even if the point were unimpeachably good, the fact would remain that in all the official, semi-official, and unofficial literature about improving the relations of Capital and Labour there is not an authoritative helpful word by an executive council. Nobody knows what Labour's real desire is. The aspirations of extremists are widely known, and the knowledge of them is disturbing, chiefly to the well-meaning outsiders who are publicly discussing the question. To suggest that the programme of the extremists alarms employers would probably be to say something for which there was very little justification. That the attitude of Trade Unionism perplexes them is, of course, common knowledge.

Parliament cannot improve the relations of Capital and Labour; Royal Commissions, Departmental Committees, Trade Union Congresses, and Labour Party Conferences are equally futile. Only employers and trade unionists, sitting in joint conferences, can do so, and it is time there were frank realisation—especially in authoritative trade union circles—that that is so. Until one or two of the more important trade union executives come into the open with definite views on the subject it is, we submit, folly to assume that the prospect of a better relationship of Capital and Labour is in any degree more hopeful. As matters stand, the current discussion by outsiders is more likely to do harm than good.

ARBITRATION ON WAR OR MARINE LOSS.

THE scheme for arbitration to decide whether a missing vessel is to be considered a war or a marine loss, at last appears to be in a fair way to be established.

The scheme was first mooted in the early spring of this year, and in an Editorial Note in our issue of May 24 we referred to it in commendatory terms. On several occasions since then we have brought the matter to notice, chiefly concerning the dilatory manner in which the authorities were dealing with it. Our advocacy of its benefits has been strong and sustained, so it is with a certain amount of satisfaction that we are able to record that an agreement has now been reached between owners, underwriters, and the Governmen insurance authorities, by which the main details have been settled and arrangements made for the inception of the scheme at an early date.

To repeat the main advantages which should accrue from the proper administration of the arbitrations scheme, the first and most important seems to be the fact that an arbitrator can award the owners of a missing vessel a certain sum to be paid by each set of underwriters.

In the case of such matters being settled by action in the courts, this solution is impossible. The Court must come to a definite decision, one way or another, and any division of liability is, by that fact, rendered impossible. The undesirability of this course has been indicated quite recently in the case of the *Euterpe*, where Mr. Justice Rowlatt could only say that in all probability the vessel was lost through a war peril, and gave judgment accordingly. An arbitrator dealing with a similar case would be able to weigh the possibilities, one against the other, and whatever proportions one bore to another, so much liability would attach to each set of underwriters. Thus, presuming the probability of a war loss being three-fourths, as against one-fourth of probability that the loss was caused by a marine peril, the war underwriters would be held liable for three-fourths of the loss, and the marine underwriters for the other fourth.

Then again there is the question of evidence. It is true that the Admiralty have intimated that they are not prepared to disclose any evidence in their possession which might bear on a case, if, in their opinion, such disclosure should be undesirable; but it is conceivable that evidence which could not be produced in the courts might be divulged to an arbitrator, who, being in part appointed by the Government, could be trusted with information which it would be impolitic to produce in the more accessible atmosphere of an action at law.

The question of time and expense have also their bearing on the matter. The delay in getting a case settled under ordinary legal procedure is considerable. Under arbitration a case can be settled with a minimum of wasted time, once the evidence has been collected, while a substantial fee paid to an arbitrator is but a fraction of the cost of a legal process with its fees to counsel, and concomitant expenses.

Yet a further advantage presents itself when the possibility of fresh evidence becoming available after a case has been settled is considered. Here, the arbitrator has but to reconsider his award. The fresh evidence weighed by the same mind that pondered the original case can better show its true value than in an entirely fresh presentation of reopened argument.

It is presumed that the scheme will come into operation at an early date, and it is to be hoped that this is indeed the case. There are several instances where owners have awaited the coming of the new scheme rather than take action in the courts, and it is this fact that shows, in our opinion, how great the favour is with which the new departure is regarded in those quarters. Nor is the insurance market less eager with its approval. Marine underwriters have undoubtedly suffered injustices under the old scheme, whereby doubtful losses have been settled in the best way available, either by action in court or by compromise, and they are the first to welcome a change which promises a certain amount of consideration being given to the interests of all parties in an unbiased manner. The third party to the agreement is the Government, which, through the mutual clubs, is the principal war risk underwriter of to-day. Presumably the scheme has found favour in their eyes also, since they have accepted it, though it is generally believed that such delays as have occurred have emanated from this quarter. Concerning this, however, we have no definite information, and it is enough for the present that the scheme has been approved and will shortly be in action. With what result the future alone can show, but we hope from time to time to be able to give indications of the progress which is being made, and without pronouncing definitely that the perfect method of solving the vexed question of "War or Marine Loss?" has been found, we anticipate that once the scheme is in full working order, its institution will be regretted by none.

TRADE PUBLICATIONS.

[*Copies of any of the publications mentioned in this section will be sent on application to the firms by which they are issued.*]

Book of Information for Employees. Issued by Petter's, Ltd., Yeovil, Somerset, England.

It is one of the first principles of success in business to win the interest of the employees in the work they do. There are many ways of doing this, but Messrs. Petter have hit upon the novel method of drawing up and distributing to their workpeople a little booklet artistically conceived, and containing an account of the past, the present, and the future of the establishment in which they are employed. They are thus stimulated by the thought that their individual effort goes toward the gradual building up of a successful industry. And not only does a booklet such as this lend itself to a description of the details of the business in which the worker is engaged, but mention can also be made of the part which the firm is playing in the production of material necessary for the war, and of the extent to which the employees have fought and sacrificed themselves for their country's cause. The booklet is also useful in

detailing the various facilities provided by the employers for recreation, study, medical treatment, &c., of which the employee might possibly be ignorant. It will undoubtedly be of interest to the employees to know how the war has been responsible for extensions in the activities of this well-known firm. Originally builders of stationary and marine oil engines, of which they turn out many different models in sizes varying from 2 to 300 b.h.p., the works were extended just before the war by the erection of an iron foundry in which the castings required by the firm are prepared. This has been enlarged since the outbreak of war, and now mild steel castings are made for outside firms. An aircraft works, and works for the manufacture of motor ploughs and agricultural tractors, have been added recently, and it is hoped that these extensions will be of the utmost value in meeting the needs of the country after the war.

LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by Correspondents.*]

POSITION OF BRITISH SHIPOWNERS AFTER THE WAR.

B.E.F., France,
November 4, 1917.

TO THE EDITOR OF SHIPBUILDING AND SHIPPING RECORD.

You refer in your issue of November 1 to the position of British shipowners after the war as "grave" (page 410) and "hopeless" (page 412), and say that British shipowners should, in the national interest, be allowed to retain a larger proportion of their profits in order that they may recuperate after the war. Until there is some certainty that the shipping companies would retain as a reserve these extra profits and not pay them away to shareholders, this demand is hardly likely to receive much attention.

Omitting transatlantic concerns, the 17 largest concerns in your list have paid dividends ranging from 15 per cent. to 50 per cent. Surely this is not the way to strengthen their case in the public eye or to obtain for themselves the right to retain a larger share of the profits for future use.

ENGINEER.

EDUCATION OF ENGINEERS AND SHIPBUILDERS.

NORTH-EAST COAST DRAUGHTSMEN'S VIEWS.

Noteworthy contributions to the present-day discussion as to the education of those youths who aspire to enter the engineering and shipbuilding industries were made at last Friday evening's meeting of the Newcastle branch of the Association of Engineering and Shipbuilding Draughtsmen, held at the Connaught Hall, Newcastle-on-Tyne. Mr. O. J. Williams presided.

The discussion was opened by a paper by Mr. F. Hope, who affirmed that the ideal of "Equality of opportunity" could only become a reality when the workers of the world could claim an efficient system of education as their perfect right. He wished to deal with a scheme for a more efficient training of shipbuilding apprentices. He would consider drawing-office apprentices and ordinary shipyard apprentices separately. In the case of the former, a boy commencing his apprenticeship had evening studies, comprising naval architecture, mathematics and mechanics. In the majority of cases what happened was that, for the first two years, if the boy were keen, he succeeded in doing fairly well, but, as his apprenticeship neared its close, his interest in his studies waned and it was left to the small minority to pursue the higher branches of these subjects. Mr. Hope calculated that the daily programme for eight or nine months of the year for the boy involved an expenditure of 14 hours per day for five days of the week in work, study and travelling to and fro, leaving only 10 hours for sleep and recreation. Taking into consideration the sedentary nature of his occupation, such demands upon the apprentice's time and energy served to hinder all but the gifted and the determined. A boy sometimes served in the drawing-office, during which his spare time was thus taken up for two years, and then, either by means of a scholarship or private means, left the drawing-office for three years in order to take up the university course. From an educational standpoint that was a great advantage, but it meant that, just when the boy was beginning to understand something of the business he had chosen for his life's work, he was removed from the environment of the shipyard for three years. He returned to the drawing-office after his three years, only to find that he had lost not only the practical training, but also the interest in the practical side of the business.

The problem of the ordinary shipyard trade apprentice was more difficult. The educational authorities seemed to draw up their syllabus with an indifference to the boys' conditions, with the result that a long and laborious course was set down and made compulsory to each student. Before a boy could be enrolled in, say, Stage I, naval architecture or a practical shipbuilding course, he must take a course of practical mathematics and elementary physics. Whilst the author thought it advantageous to every apprentice to know something of these subjects, it appeared, from practical dealing with this class of student, that a course of arithmetic and English would be more beneficial. Under the course system, with the boy expected to attend a two hours' lecture on three nights per week and to do certain homework, his working, studying and travelling day was of about 17 hours' duration on five days of the week for about six months of the year. Notice would have to be taken of the old adage, that "All work and no play makes Jack a dull boy."

Some Tyne shipbuilders had tried to tackle the subject by compelling their apprentices to attend evening classes, but their efforts had not been a decided success. Inducements, in the shape of bonuses, increased rates of wages, drawing-office apprenticeships, &c., had been held out to boys to attend naval architecture classes, &c., and in some instances apprentices had been engaged only on condition that they attended the classes. That compulsion, under existing conditions, had proved futile. They were faced with the fact, also, that the time intervening between a boy leaving school and commencing his apprenticeship, about two years, was practically wasted educationally, with the result that the boy forgot very soon what he had been taught.

Mr. Hope advocated that, when a boy had finished his elementary school education at about the age of 13, he should be transferred to a technical school for a course of instruction suited to the particular trade he proposed to follow. The course should extend right up to the time he commenced to serve his apprenticeship and should include a training in the groundwork of technical subjects, including mathematics, geometry, physics, experimental mechanics and suitable drawing. The training should be carried out by the educational authorities in each district and should be compulsory on all boys intending to enter the shipbuilding profession. Arrangements should be made with employers that such boys, on reaching the age of 16, could be transferred to the particular trade they wished to follow. Should the number of boys desiring to follow a particular trade be in excess of the number required by the employer, the selection should be made by examination. Up to that point no attempt should be made to teach the actual trade or profession, but merely the educational basis necessary. Up to that point youths, whether for the drawing-office or for the ordinary shipyard trades, should receive identical training.

During the actual apprenticeship training, drawing-office apprentices should be educated during working hours, and be taught in the higher branches of the subjects already mentioned, with the addition of naval architecture. A special class should be arranged for that purpose in each centre, with about 10 hours per week set aside for such instruction. Examinations should be held every six months and the successful boys should go into a higher category. The syllabus should be so arranged that any youth, on reaching

the age of 18 or 19, could take the degree course. For that purpose a central class should be formed for a particular area, and the apprentices' instruction so arranged that at least half of their time could still be spent in the drawing-office. The outcome of that training should be that, when a youth finished his apprenticeship, his education should be such that he would take up his work in any shipyard, confident that he would render a good account of himself. In short, an apprentice should attend the necessary instruction classes until the finish of his apprenticeship at the age of 21. If possible, nine or twelve months of his time should be spent in the shipyard working with the loftsmen, platers and shipwrights, in order that the practical side of the profession might be studied.

In the case of ordinary shipyard trade apprentices, the employer should release them during work hours for instruction for at least eight hours per week. That system had been and was being actually carried out by some firms, *e.g.*, the firm with which the author was connected, Sir W. G. Armstrong, Whitworth & Co., Ltd., at Walker Shipyard, was now entering on its third year of such instruction. After a teaching experience extending over 16 years, the author declared that such a system was, to his mind, the only solution of the problem of shipyard apprentice training. The training consisted of apprentices attending classes for instruction in mathematics, physics, machine construction and naval architecture for a total of six hours weekly. The difficulties met with up to the present had been those of persuading apprentices to take up the studies they had put to one side fully two years before and the giving of suitable instruction to prepare them for taking up the above-mentioned subjects, but with those difficulties removed under the technical education system suggested, a much broader scheme could be undertaken. The latter would consist in giving each apprentice definite instruction in his own particular trade also. For that purpose certain trades must be grouped together, viz., platers, caulkers, riveters, drillers and shipwrights, and a full course of practical shipbuilding given. Carpenters and joiners should be instructed in carpentry, woodwork and joinery, and other trades in various matters directly applicable to each. The attendance at such classes should be compulsory up to the age of 19 or 20 (with the exception of certain trades, such as riveters, drillers, &c.), and arrangements should be made to transfer youths of exceptional ability to the drawing-office apprentice course to continue their studies in the higher branches of the various subjects until their apprenticeship was finished. Teachers for that important work should be carefully chosen. The technical school teachers, who had charge of the boys from 13 to 16 years, should be men having a good technical experience, knowing exactly the difficulties which the boys would eventually meet and be capable of imparting the necessary knowledge. The instructors in the actual apprenticeship courses should be men in thorough touch with the shipbuilding profession, who, realising all its requirements, would place before the students such practical application as would create an interest in the work. The instructors for the various trades should be men of exceptional ability and experience in those trades and should be carefully selected by the employer. In the case of the drawing-office students, it was essential that the instruction should be given by experts, care being taken that the teachers were conversant with the practical as well as the theoretical side of the subject. Only by such instructors could the apprentice be taught the principles upon which the various parts of the work were based, the usual difficulties to be met with and the means of overcoming them, thereby making it possible for him to have a comprehensive knowledge of his own trade. The educational authorities should appoint a committee of gentlemen in touch with educational requirements to act in conjunction with a number of technical experts appointed by the employers, the committee to have the power to arrange the syllabus, hours of instruction and other details; but the appointment of instructors for the teaching of the various trades should be entirely in the hands of each employer. The committee should arrange the centres for instruction, but the author recommended, from experience, that the teaching of shipyard trade apprentices should be carried out in each particular shipyard in suitable rooms set apart for that purpose.

Under such a scheme greater success might be anticipated. The apprentice should receive instruction in the very department in which he required it, he would be taught to think for himself, and would have the advantages of a theoretical as well as a practical training. To-day the theoretical part, especially in yard trades, had to be done by the foreman, with the result that a large number of men had long since refused to think for themselves and carried out without question what their foreman suggested, whether it were right or wrong. By proper training it would be possible to raise all workers to a status which would bring with it a desire for increased knowledge, a wider outlook, a development of the virtues of discipline and self-control, a greater toleration and the requisite foundation for further instruction in the rights and obligations of citizenship. It often happened that an apprentice who commenced at a particular trade found that he was not suited for it. Under the scheme advocated his instructor would also realise that fact, and naturally it would be to the interests of both youth and employer to have a change effected. Such a thing was not possible under existing conditions, and the best was not being got out of many of the employees. There were many who still believed in the old methods and did not hesitate to say that we had been brought, by the use of these, to such a state of proficiency as now existed; but it was surely conceivable that there were heights still to be reached which would never be realised until more up-to-date methods were used.

The operation of the scheme would call for great reorganisation in every shipyard. No boys would be available until 16, when it would be necessary for them to start their apprenticeship. How would the work at present done by boys between the ages of 14 and 16 be carried out? The writer thought it might equally well be done by female labour. The question of the labouring classes would, he thought, right itself in a large measure, as would also that of the youths at present engaged in the various duties associated with the black squad. Disorganisation would not be so great as it might at first appear, for all the boys would not be attending classes at once.

Many families depended greatly upon the earnings of boys between the ages of 14 and 16, and in a large number of cases it would be a tremendous hardship for a mother to provide for her family, seeing that the boy would not be earning wages until the age of 16. The State, which at present looked after the boy up to 14 years of age, must take up the question of the other two years, making suitable grants in necessitous cases. Directly a boy began his apprenticeship the time of instruction should be part of his training, both as regarded hours and wages.

As to how the Association could take part in the scheme, at present a youth finishing his apprenticeship could apply for admission to the society. Their regulations made no provision as to his capabilities. He had simply to serve his apprenticeship and that was all that was required to ensure his election. If the Association were going to be worthy of the name, it would have to see that its future members were worthy educationally of being enrolled. A diploma should be issued to be competed for by everyone desirous of joining, and election to their ranks should be by diploma only. An examination in theoretical and practical shipbuilding, mathematics and mechanics should be set, and, until each candidate had passed that examination and obtained his diploma he should not be elected as a member. Such a diploma should satisfy each employer of the capability of a draughtsman when applying for a situation. All the time spent in putting into operation such a scheme would be well repaid if it only succeeded in calling into being a few outstanding men whose names would live in the annals of shipbuilding history. The failure to develop the worker by proper education

and training in order to get the best possible results represented a tremendous waste, and in view of international competition the training of apprentices would go far towards reducing that waste to a minimum and so enable us to maintain our position as the premier shipbuilding nation.

Mr. A. M. Heppell followed with a paper dealing with the engineering side of the scheme, and stated that all that Mr. Hope had said regarding shipbuilding apprentices applied equally to engineering, except that in the case of engineering apprentices the distinction between the drawing-office and the shops was not made until late in the apprenticeship. In the majority of cases all apprentices entered the shops to commence their apprenticeship proper at the age of 16, and selections were made for entry into the drawing-office after a period in the shops, varying from two to four years. Some firms made the selection by examination, others left it to the discretion of the chief draughtsmen.

The system suggested by Mr. Hope, of giving instruction to apprentices during the employers' time, would remove one of the worst evils of the present course system, viz., that the time spent at class was too large a proportion of the time at the disposal of the apprentice for technical training. At present the student had very little time, indeed, for private study and homework, and depended almost solely on his class-work. The transference of the class time from evenings to during the day would effect a great improvement, but the writer felt that the best results would not be attained unless the subjects of examinations, diplomas and control were satisfactorily dealt with on a uniform national basis. The author went on to criticise in detail the present examination methods and to plead for a uniform national system. He urged also that each industry should control its own technical training, subject to certain conditions laid down by the Board of Education, and that education committees, where there was a large number of engineering students, should place the control of the engineering section in the hands of an experienced engineer who had high technical qualification. He did not favour the proposal that employers should train their own apprentices, but advised that each industry should control its own technical training through a council which would combine all the various interests of the industry. The council could be granted powers by the Board of Education similar to those granted to the Institution of Civil Engineers, the British Architects, &c., and hold examinations and award diplomas for each section of the industry. The diploma award to draughtsmen should be on the same lines as that granted by the Institution of Civil Engineers, and the result would be to increase the technical status of the draughtsman and to bring him more into line with other technical professions.

The engineering and shipbuilding draughtsman was, in some ways, superior to the architect—he worked to a smaller factor of safety, his calculations were of a higher scientific order, and his work required a higher standard of mathematical and scientific training. Architects, however, were generally acknowledged as belonging to one of the professions, whilst the draughtsman was one of a crowd. The Institute of British Architects decided the technical status of the architect, and he hoped that the Draughtsmen's Association would work towards the establishment of a council to govern similarly the status of the draughtsman.

The importance of our system of technical training of industrial workers in deciding our position amongst the leading commercial nations was hardly well enough recognised. Employers and employees were so much concerned with their political relation that they almost ignored the educational side. Employers, who were largely only financiers, were much too narrow in their outlook; they wanted to reap before they sowed, and did not encourage technical training because they had not enough faith in the financial returns from improved technical skill. Encouragement should not stop at the conclusion of an apprenticeship.

SCREW PROPELLERS.

(*Continued from page 275.*)

Four-bladed Propellers.

The large majority of single-screw ships, and also of twin-screw vessels of low and moderate speeds, are fitted with four-bladed screws. It is of importance, therefore, to be able to make use of the existing experimental data dealing with four-bladed screws, if the determination of dimensions is to be made on proper lines.

Curtis and Hewins experiments.—Taylor gave his results, which have already been referred to, in 1904, and in the year following Messrs. Curtis and Hewins—two of his assistants—read a paper to the American Society of Naval Architects and Marine Engineers which dealt with experiments on two, four, and six-bladed screws. Practical considerations have precluded the adoption of two and six-bladed propellers; therefore, the results presented dealing with these may be neglected.

In all, 24 four-bladed model screws were experimented with. These ranged in pitch ratio from ·4 to 1·5, and in disc area ratio from ·16 to ·59. The method of presentation adopted was similar to that used by Taylor, viz., curves of S (or power absorption value) and E (efficiency) were drawn on a base of slip. The formula connecting these curves with actual practice being

$$P \text{ (or power absorbed)} = \cdot 0125\ S\ D^2\ V^3.$$

Figs. 16, 17, 18 and 19, give Curtis' and Hewins' results, these being recast and presented for definite disc area ratios on a base of pitch ratio, instead of on a slip ratio base as originally given.

Comparison of three and four-bladed model screw results.—Experiments on propellers having three and four blades show that a higher efficiency is given by the screws having the smaller number of blades. This was shown clearly in Curtis' and Hewins' experiments with two and six-bladed screws. Two-bladed screws are impracticable, probably owing to the excessive vibrations which they engender. Three-bladed propellers, however, are little more likely to set up violent vibrations than are those having four blades. Why is it, then, that in the large majority of cargo and passenger ships four-bladed screws are preferred to three-bladed, if all experiments indicate that three-bladed are of greater efficiency? The answer to this is illustrated in Fig. 20. Assume as a concrete case that 1,000 propeller horse-power is to be absorbed by a propeller 15 ft. in diameter at a speed (corrected for wake) of 10 knots. Assume, further, that the pitch ratio of the propeller is unity. On Fig. 20 are drawn the S curves of a three-bladed screw of 1·0 pitch ratio, and also that of a four-bladed screw of the same pitch ratio. The efficiency curves are also shown, which indicate clearly the greater efficiency of the three-bladed screw. From the formula given for the three and four-bladed screws, P (in the three-bladed screws) $= \cdot 009365\ S\ D^2\ V^3$, and for the four, $P = \cdot 0125\ S\ D^2\ V^3$. Curves of power absorbed on a base of real slip can be drawn from which it becomes clear (1) that the four-bladed screw absorbs the 1,000 h.p. at a much smaller real slip than does the three-bladed propeller, and (2) *that the efficiencies of the three and four-bladed propellers at the real slip at which the given power is absorbed are very much alike.* Thus, the greater efficiency of three-bladed screws may be nullified when the real slip at which the propeller horse-power is absorbed is taken into account. The higher efficiencies of three-bladed propellers is, therefore, more apparent than real.

Another factor which has some weight, with sea-going people in particular, is that four-bladed propellers consistently show a smaller apparent slip than do three-bladed. This may not have any solid basis as an argument in favour of the four-bladed screw as regards efficiency, but the fact remains that a small apparent slip is still desired by most sea-going engineers. The best argument which may be advanced in favour of four-bladed screws is that many vessels with these fitted have given really excellent results.

Wake values to use with these curves.—In the former article dealing

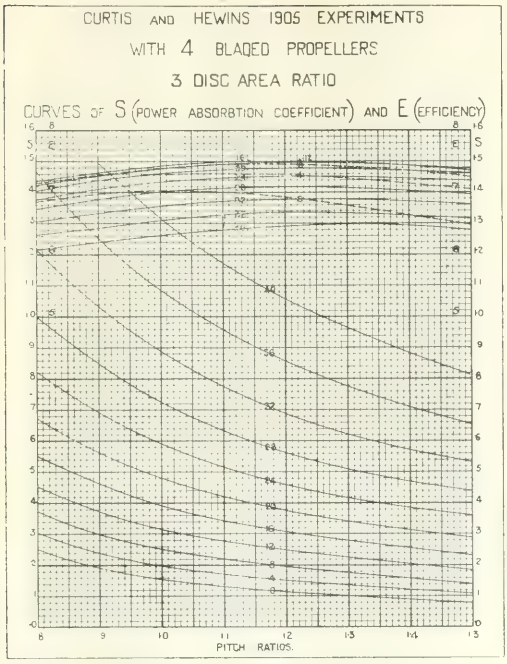

CURTIS AND HEWINS 1905 EXPERIMENTS
WITH 4 BLADED PROPELLERS
3 DISC AREA RATIO
CURVES OF S (POWER ABSORBTION COEFFICIENT) AND E (EFFICIENCY)
PITCH RATIOS.

Fig. 16.

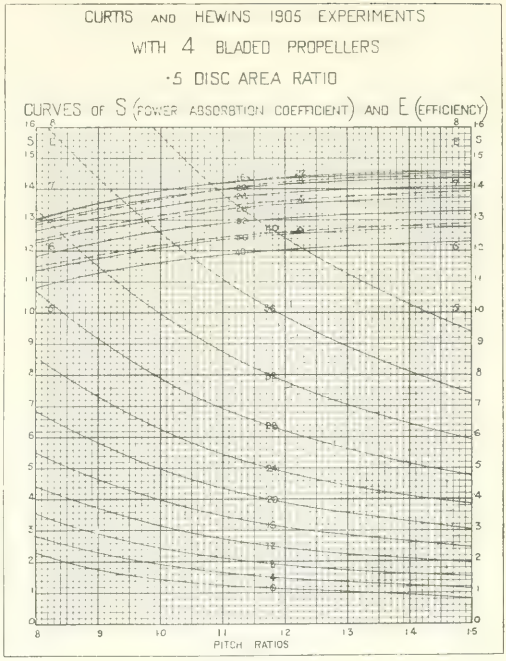

CURTIS AND HEWINS 1905 EXPERIMENTS
WITH 4 BLADED PROPELLERS
·5 DISC AREA RATIO
CURVES OF S (POWER ABSORBTION COEFFICIENT) AND E (EFFICIENCY)
PITCH RATIOS

Fig. 18.

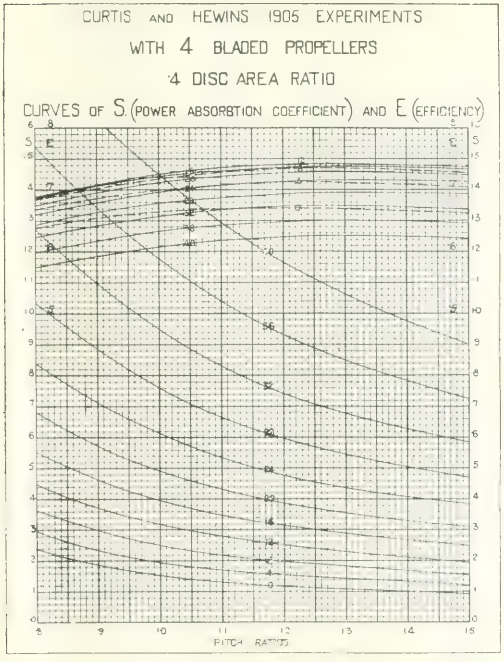

CURTIS AND HEWINS 1905 EXPERIMENTS
WITH 4 BLADED PROPELLERS
·4 DISC AREA RATIO
CURVES OF S (POWER ABSORBTION COEFFICIENT) AND E (EFFICIENCY)
PITCH RATIOS

Fig. 17.

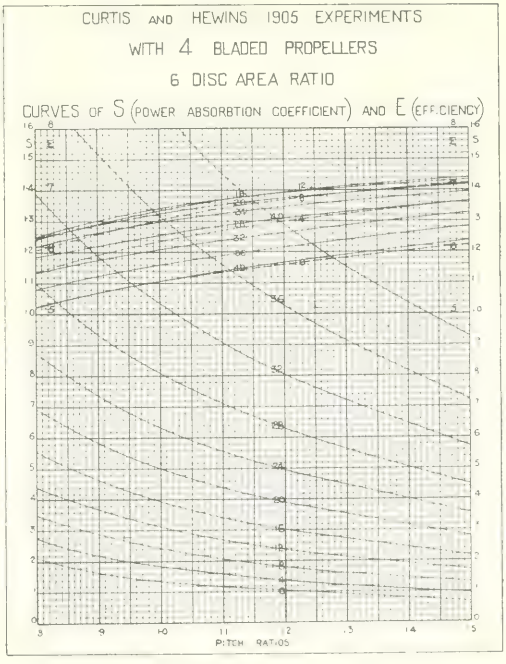

CURTIS AND HEWINS 1905 EXPERIMENTS
WITH 4 BLADED PROPELLERS
6 DISC AREA RATIO
CURVES OF S (POWER ABSORBTION COEFFICIENT) AND E (EFFICIENCY)
PITCH RATIOS

Fig. 19.

with three-bladed screws, a sketch was given which showed the experimental and analysis wake values found, by Mr. Luke, to suit admirably in the design of three-bladed propellers. From the analysis of a large number of trials of vessels having four-bladed screws, it appears that these wake values are not suitable for the design of four-bladed propellers. In the majority of cases analysed by the writer, the analysis wakes were considerably less in value

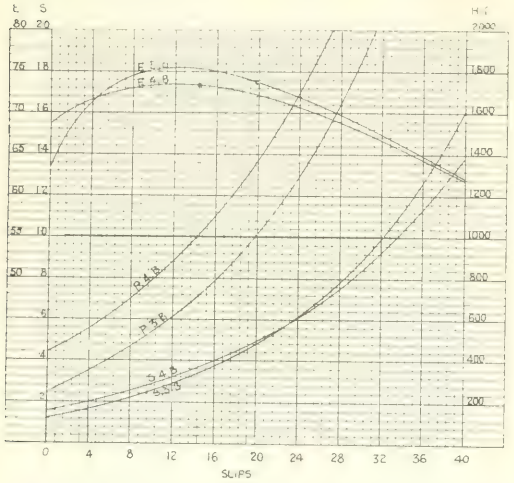


Fig. 20.—Comparison of Curves of S (Power Absorption Value), E (Efficiency), and P (Horse-Power Absorbed), of 3 and 4-Bladed Propellers of 15-ft. diameter, 15-ft. pitch, and 62 sq. ft. surface, advancing at 10 knots.

than experimental results indicated as being reasonable. It must not be inferred from this that a less wake exists in the region of four-bladed screws than in that of three. It is probable that wakes deduced by analysis from four-bladed curves *understate* the real speed of the wake in which the propellers are working. If the article

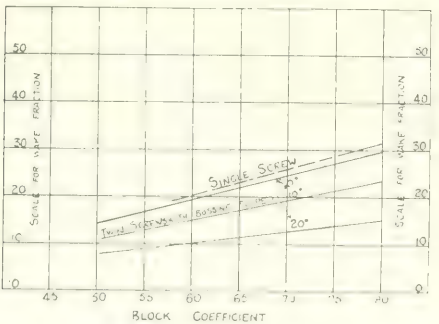


Fig. 21.—Values of Wake Fractions (obtained by Analysis of Trial Results), suitable for Designing from Curtis & Hewins' 4-Bladed Propeller Curves.

on "Analysis for Wake" (*Shipbuilding and Shipping Record*, May 3, 1917) be referred to, the reason why these analysis wakes are less than the experimental in the case of four-bladed screws is discussed.

By analysis it is found that the real slip at which the given power is absorbed is less than that expected from considerations of apparent slip and experimental wakes. At the real slip, proper to the observed apparent slip and experimental wake, the power which would be absorbed by the screws is in excess of that actually produced. Two methods may, therefore, be adopted in designing four-bladed screws from the curves, viz.: (1) to so modify the power that the experimental wakes may be given by analysis, or (2) to use analysis wakes in design, which may not agree with the experimental. There are arguments for and against both of these methods. By modifying the power value, the design is made for some power which is not the real horse-power absorbed, but the proper real slip of the screws

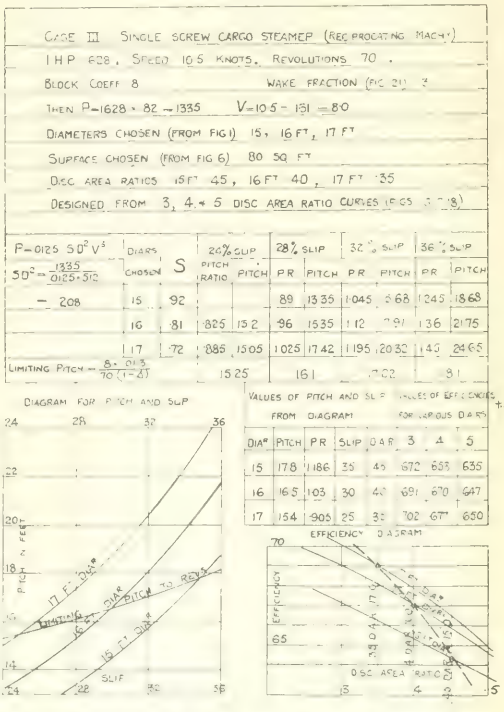

CASE III SINGLE SCREW CARGO STEAMER (RECIPROCATING MACH.)
I.H.P. 1628, SPEED 10·5 KNOTS, REVOLUTIONS 70.
BLOCK COEFF. 8 WAKE FRACTION (FIG 21) ·2
THEN P=1628 × 82 ÷ 1335 V=10·5 − 151 = 8·0
DIAMETERS CHOSEN (FROM FIG 1) 15, 16 FT, 17 FT
SURFACE CHOSEN (FROM FIG 6) 80 SQ FT
DISC AREA RATIOS 15FT ·45, 16FT ·40, 17FT ·35
DESIGNED FROM 3, 4 & 5 DISC AREA RATIO CURVES (FIGS 3 TO 8)
P=0125 SD² V³
SD²=1335/0125×512
=208
DIAMS CHOSEN
S
26% SLIP
28% SLIP
32% SLIP
36% SLIP
PITCH RATIO
PITCH
P.R.
PITCH
P.R.
PITCH
P.R.
PITCH
15 92 89 1335 1045 968 1245 1868
16 81 825 152 96 1535 112 891 136 2175
17 72 885 1505 1025 1742 1195 2032 145 2465
LIMITING PITCH = 8·0/70(1−·43) 15·25 16·1 17·02 18·1
DIAGRAM FOR PITCH AND SLIP
PITCH IN FEET
SLIP
17 FT DIA
16 FT DIA
15 FT DIA
PITCH TO REVS
VALUES OF PITCH AND SLIP FOR MAXIMUM EFFICIENCIES FROM DIAGRAM FOR VARIOUS DIAMS
DIA PITCH P.R. SLIP DISC AREA RATIO 3 4 5
15 17·8 1186 35 45 672 683 635
16 16·5 1103 30 40 691 670 647
17 15·4 905 25 33 702 677 650
EFFICIENCY DIAGRAM
EFFICIENCY
DISC AREA RATIO
THE HIGHEST EFFICIENCY IS ASSOCIATED WITH THE PROPELLER OF GREATEST DIAMETER
THE PROPELLER CHOSEN WAS 17 6" DIA 8·0 PITCH, SURFACE 4 TIMES DISC AREA.
MR BENHOLM HEWINS PAPER I.N.A. VOL LVIII
THESE EFFICIENCIES ARE TAKEN OFF AT THE PARTICULAR SLIP RATIOS GIVEN IN THE ABOVE TABLE

Fig. 22.—Example of Design. Single-screw Cargo Steamer, 1,628 i.h.p.

is found, and the corresponding efficiencies obtained. The modification in power is given by multiplying the power delivered to the screw by (1·4 − 7 D.A.R.), and designing for the power so modified. Thus, if the disc area ratio be ·3, then the power multiplied would be 1·19. By using analysis wakes, the design can be proceeded with, by using direct the known propeller horse-powers, but the real slip given by this method is under what would actually be obtained by the full-sized screws.

In the examples given the propeller dimensions have been ascertained by the second method, viz., by using the wake values given in Fig. 21.

The examples.—Two examples have been worked out both for single-screw [illegible] advantage to be gained by

using the maximum diameter compatible with the problem is clearly indicated.

In the first problem (Fig. 22) case A in Mr. Denholm Young's paper "On the Co-ordination of Propeller Results" (Transactions of the Institute of Naval Architects, Vol. LVIII.) has been examined. From the diagram it is clear that in this case there was no restriction in diameter, and that that of the highest experimental efficiency could be adopted. The following are the particulars of some of the propellers which would fulfil the stipulated conditions of power, revolutions and speed:

Diameter in ft.	Pitch in ft.	Surface in sq. ft.	Efficiency per cent.
15	17·8	50 to 55	64
16	16·5	,,	67
17	15·4	,,	69
17·5	15·0	,,	70

Chosen restriction of diameter.—In the second problem (Fig 23), the evil effects which frequently follow where the diameter is too

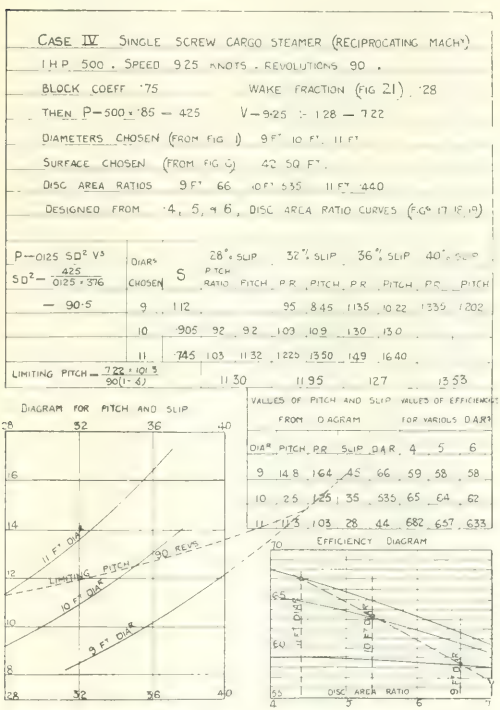

CASE IV SINGLE SCREW CARGO STEAMER (RECIPROCATING MACHY)
I.H.P. 500 . SPEED 9·25 KNOTS . REVOLUTIONS 90 .
BLOCK COEFF ·75 WAKE FRACTION (FIG 21) ·28
THEN P = 500 × ·85 = 425 V = 9·25 × ·128 = 7·22
DIAMETERS CHOSEN (FROM FIG 1) 9 FT 10 FT. 11 FT
SURFACE CHOSEN (FROM FIG 2) 42 SQ FT.
DISC AREA RATIOS 9 FT 66 10 FT 535 11 FT 440
DESIGNED FROM ·4, 5, & 6, DISC AREA RATIO CURVES (FIGS 17 18 19)
P = 0125 SD² V³
S = 425 / 0125 × 376
= 90·5
DIAM CHOSEN
28% SLIP 32% SLIP 36% SLIP 40% SLIP
PITCH RATIO PITCH P.R PITCH P.R PITCH P.R PITCH P.R
9 1·12 95 ·845 1·135 1·022 1·339 1·202
10 ·905 ·92 ·92 1·03 1·09 1·30 1·30
11 ·745 1·03 1·132 1·225 1·350 1·49 1·640
LIMITING PITCH = 722 × 10·3 / 90(1 − 6) 11·30 11·95 12·7 13·53
DIAGRAM FOR PITCH AND SLIP
11 F. DIAM
LIMITING PITCH
10 FT DIAM
9 FT DIAM
90 REVS
VALUES OF PITCH AND SLIP FROM DIAGRAM
VALUES OF EFFICIENCY FOR VARIOUS DIAMS
DIAM PITCH P.R SLIP P.R 4 5 6
9 14·8 164 45 66 59 58 58
10 2·5 125 35 535 65 64 62
11 1·13 103 28 44 682 657 633
EFFICIENCY DIAGRAM
11 FT DIAM
10 FT DIAM
9 FT DIAM
DISC AREA RATIO
IN THIS CASE ALSO THE HIGHEST EFFICIENCY IS ASSOCIATED WITH THE GREATEST DIAM THE LIMITING DIAM HOWEVER WAS 8·9 THE PITCH PROPER TO THIS DIAM BEING 15 6 THE DISC AREA RATIO OF A PROPELLER OF 8·9 DIAM AND 42 SQ FT SURFACE IS 7 AND THE EFFICIENCY = 56·5 % WHEREAS A SCREW 11 FT IN DIAM AND 11·3 PITCH OF THE SAME SURFACE HAS AN EFFICIENCY OF 67 PER CENT

Fig. 23.—Example of Design, Single-screw Steamer 500 i.h.p.

greatly restricted is well illustrated. It is also an example from actual practice. The propeller horse-power is given as 425, and the revolutions 90. If Fig. 1 be referred to, it will be found that the propeller given by the average practice line is 10 ft. 9 in. diam., and about 12 ft. pitch. In this particular case the diameter was limited to 8 ft. 9 in., the loss in efficiency which followed is indicated in the figures here given:—

Diameter in ft.	Pitch in ft.	Surface in sq. ft.	Efficiency per cent.
8·75	12·58	42	56·5
9	11·88	,,	58·5
10	12·75	,,	63·5
11	11·30	,,	67·5

The above comparison shows that had it been possible to adopt the most suitable diameter, an improvement in performance of 18 per cent. might have been obtained. Captain D. W. Dyson, in his book on "Screw Propellers," draws attention to this loss in efficiency, which accompanies restricted diameter, and the example given shows that this may have a very material effect on the performance of a ship.

Limits of pitch ratio.—One very important point must be referred to in connection with this subject of restricted diameter. It may be that the curves of design indicate that a propeller of very large diameter and of relatively small pitch would give the greatest efficiency. There is, however, a limit set to the pitch ratio advisable to adopt. It has been found in actual experience, in full-sized ships, that it is inadvisable to adopt a propeller with a pitch ratio under ·85 or thereabouts. In the case of the United States cruiser *Salem* several propellers were tried, the two sets which gave the *lowest* propulsive efficiency were of the greatest diameter, but the pitch ratios of both sets were in the region of ·7, which proved to be far too low. This practical rule should be adhered to: *that it is inadvisable to adopt a propeller of maximum diameter if the pitch ratio associated with this diameter is under* ·85.

Engineering and Shipbuilding Bonus.

An award has just been issued by the Committee on Production giving a further advance of wages to all grades of workmen employed by members of the Engineering Employers' Federation. The award is given in pursuance of an agreement between the Federation and 48 trade unions connected with the engineering and foundry trades, under the terms of which the Committee on Production may be called upon at intervals of four months (*i.e.*, February, June and October) to consider what alteration in wages is warranted by the abnormal conditions due to the war.

The claims put before the Committee by the unions were based upon the high cost of living. Their finding is as follows:—

1. The men concerned, aged 18 years and over, shall receive 5s. per full ordinary week.

2. To boys and youths and apprentices under 18 years of age there shall be paid 2s. 6d. per full ordinary week. Boys and youths and apprentices on attaining the age of 18 shall receive a further advance of 2s. 6d.

3. In the case of piece workers, premium bonus workers, and other men working on systems of payment by results, the amount is to be paid by the firms at the rate of 5s. per full ordinary week over and above the week's earnings of the men concerned, calculated on the present basis.

4. The advances hereby awarded are to be paid as from the beginning of the first full pay in December, 1917.

5. The amounts hereby awarded are to be taken into account in the calculation of payment for overtime or night duty or for work on Sundays and holidays, but they are not otherwise to apply to or affect present time rates, premium bonus rates, or piecework prices, and are not to be taken into account as part of the time rates for the purpose of fixing new piecework prices or bonus rates.

6. This award shall not apply in those cases in which it has been the practice to regulate the wages of the men concerned by the movements in the wages of men of a similar class employed in trades other than the engineering trade.

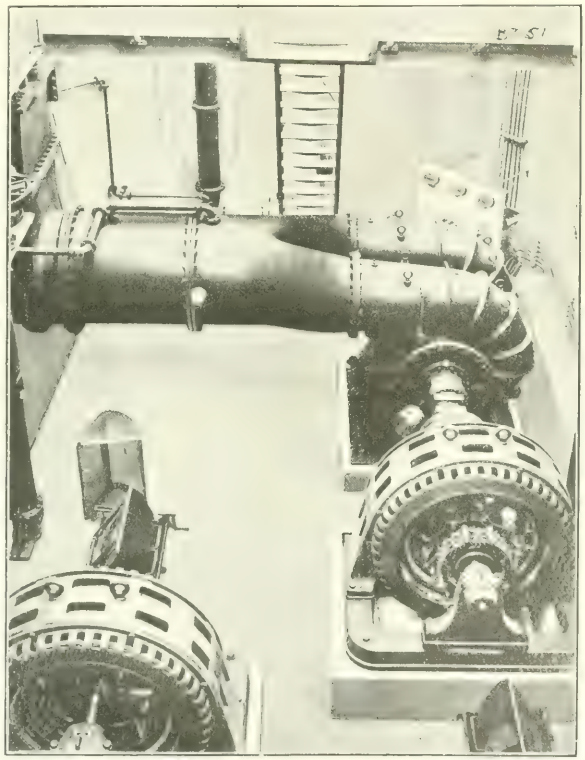
7. The amounts hereby awarded are over and above the advances given in the awards of March 1 and July 14 last; they are to be regarded as war advances intended to assist in meeting the increased cost of living and are to be recognised as due to and dependent on the existence of the abnormal conditions now prevailing in consequence of the war.

8. Applications for special advances in certain districts made in accordance with the second paragraph of Clause (1) of the Agreement between the Engineering Employers' Federation and the unions are still under consideration by the Committee, and decisions in regard thereto will be issued shortly.

ELECTRIC POWER AND SHIP REPAIRS.

Nowhere is the stress of heavy running more in evidence than in a ship repairing establishment. Nevertheless, the electric drive has been satisfactorily applied, and successful examples are to be seen in various shipyards, also in a number of dry docks, both of the graving and floating type, on the North East Coast. The test of trial is well exemplified by an installation, "somewhere near the North Sea," the electrical features of which are described below. This important establishment is the second to be electrically equipped for the same owners, and covers two large graving docks, 450 ft. and 550 ft. respectively in length, a shipyard capable of accommodating nearly 20 large trawlers, also a berth for bigger vessels arriving for engine repairs; plus the necessary works and offices. This shipyard forms, so to speak, an extension of another about 30 miles away, the older establishment being fitted some years previously with Westinghouse motors, this plant including a remarkable installation of pumping and lighting machinery upon a huge pontoon floating dock.

In the case now to be outlined, the graving docks are equipped with Worthington main twin pumps, direct coupled to two 400-h.p. Westinghouse motors of A.C. slip-ring type, these motors being set in operation by means of liquid starters. Each pump has suction and delivery pipes of 48 in. diameter, and is designed for a constant output of 42,000 gallons at a speed of 295 revolutions per minute. The official tests of the main pumps gave, in fact, an increased figure of 10 per cent. over this quantity, the docks being emptied in correspondingly shorter time. There is also installed a Worthington low lift pump, coupled to a 30-h.p. squirrel-cage Westinghouse motor for draining purposes, with a capacity of 2,000 gallons per minute against a maximum head of 15 ft. A small priming pump with a 4-h.p. motor and chain drive is utilised for charging the main pumps. Should it happen that they lose their water when either of the docks is near to being emptied.



Two 400-h.p. Westinghouse Induction Motors, driving Worthington Twin Centrifugal Pumps.

The gears for working the emptying and discharge valves are also of especial interest, inasmuch as they can be worked either electrically or by hand, eight motors, each of 4-h.p., being used, and each machine provided with automatic cut-out gear. This arrangement obviates all risk of the valves jamming.

The pumping plant is in an underground pump-room located near the dock entrances, and the dock master is able to control operations by means of telegraph gear. The haulage equipment consists of five capstans, all electrically driven, two placed at the dock ends and three at the entrances, and each capstan capable of haulage speeds of 40 ft. per minute at a 5-ton pull, and 120 ft. per minute at a $1\frac{3}{4}$-ton pull.

The large jib crane, the track for which runs between the docks, has a capacity of 25 tons at a 42-ft. radius, the lifting speeds varying from 20 ft. per minute on heavy loads to 100 ft. per minute on loads of 5 tons. This crane was designed and built by Geo. Russel & Co., and has four British Westinghouse motors ranging from 15 h.p. for travelling to 48 h.p. for lifting purposes. Three motors are contained in the cabin, the fourth, or travelling motor, being mounted on the crane carriage, which is of the four-legged straddle type. Each motor is fitted with electro-magnetic braking, and the hoisting and derricking gears are equipped with automatic, mechanical and foot or hand brakes. Plug boxes placed at different points on the track enable power to be supplied by means of a flexible armoured cable.

The fitting and machine shops are of considerable area and contain many examples of electric driving, all important machine tools being independently driven by motors, some of these requiring motors up to 50 h.p. capacity, and one large set of rolls, built by Jas. Bennie & Sons, being run by a 75 h.p. Westinghouse slip-ring motor, another of 25 h.p. (squirrel-cage type) serving to lift the rolls, which are 15 ins. in diameter and 30 ft. in length. The main machine shop has a 30-ton travelling crane, this also electrically operated. A striking feature of the shop is the method of driving two lines of shafting for groups of machine tools, each line having two 30-h.p. Westinghouse motors, Renold chains being utilised for the purpose of power transmission. A neat gear case entirely encloses both gears and chains, and whenever a single line of shafting is required, a simple method of disconnection enables it to be run alone.

The sub-station [illegible] in a corner of the works contains a line switchgear equipment on polished slate panels, also the two 60-k.w. motor-generator sets for lock and works lighting, and an air compressor driven by a 120-h.p. slip-ring motor, this latter being set in operation by an automatic liquid starter, controlled by the variation of air pressure in the receiver. A 22 k.v.a. 440/220 volt single-phase oil-insulated self-cooled transformer is used for lighting supply when the d.c. sets are not running. Power for this sub-station is fed from the main sub-station near at hand, where a 500 k.v.a. self-cooled transformer deals with the three-phase current

received at 3,000 volts from the local supply mains. From this latter-mentioned station the various circuits are run direct to works, pumping station, dock crane, and to the shipyard. The whole of the electrical equipment, with the exception of the capstans, was supplied by the British Westinghouse Company, and all sections of the apparatus have splendidly withstood the stress of seven years operation, the last three years of war amply proving the worth and reliability of the plant.

BRASS AND OTHER COPPER ALLOYS USED IN MARINE ENGINEERING.*

(*Continued from page* 416.)

Mr. Flinn, in both papers, states that the trouble experienced may be classified as follows: —

(1) Breaks from stress, (*a*) initial stress due to methods of manufacture and (*b*) applied stress due to use.

(2) Damage by wrong heat treatment as in forging, bending, flanging, upsetting and annealing.

Damage of class 2 results entirely from lack of skill, knowledge or care on the part of the manufacturer.

Damage of class 1 (*b*) is dealt with in the joint paper of Messrs. Flinn and Jonson. They point out that manufacturers claimed for some of their special bronzes greater strength and toughness than steel possesses, besides being so much less liable to deterioration from corrosion. Ultimate strength and ultimate extension, however, are not the qualities which should determine the greatest stress which might be used in structures; this should be determined by the yield point of the material, the ultimate strength having little to do with the safe working stress when comparing different sorts of material.

The authors, however, are careful to refer to the "true" yield point of the metal, and state that a high yield point signifies nothing unless it is known what portion of this yield point is cancelled by initial stress, and, therefore, not available for working stress. They point out that if a test piece is continuously stretched by a gradually increasing load, when the true yield point is reached the metal flows until it is sufficiently hardened to carry the load. This, of course, is well known to be so in the case of all ductile materials. If a piece of ductile material, whether it is a test piece or a piece of structural material, is subjected to a stress which deforms it, its yield point as regards further deformation due to the same kind of stress is raised, and it will not further deform until it is subjected to a greater stress than that initially put upon it. When it is seen in the tests of the material used in the aqueduct work quoted in Mr. Flinn's papers that the ratio of yield point to ultimate strength ranges from 50 to 68 per cent. in the case of forgings, and from 45 to 71 per cent. in castings, one is forced to conclude that some of the results were obtained from specimens which were either subjected to high initial stresses or which had been submitted to high stress before test, and that, therefore, the recorded yield points were not "true." It is precisely this difficulty which has led our engineers to omit conditions as to yield point from acceptance specifications for ordinary steel for constructive purposes.

The authors of the paper upon the Inspection of Brass and Bronze consider that the acceptance tests should include measurements of initial stress, and they suggest methods for determining this. They state that initial stress may be relieved in two ways: either by stretching the metal near the surface by mechanical work or by temporarily reducing its elastic limit by heating, and thus allowing it to be stretched by the compressive stress of the interior of the metal. The mechanical working used for the purpose is either squeezing between the rolls of a straightening machine or bending the bar successively in four directions at right angles to one another. This operation in America is given the name of "springing." Annealing, however, appears to be the more reliable method. They state that it has been proved that if sufficient time is allowed for annealing the temperature need not be so high as is required where initial stress has to be eliminated by quick annealing, so that it is possible to eliminate initial stress by slow annealing without appreciably lowering the yield point given by cold drawing.

The question of "burning on" tips of propeller blades was referred to when the previous paper on brass was read at this Institute. In this connection the remarks of Messrs. Flinn and Jonson upon foundry repairs will be of considerable interest. They say that as brass and bronze castings are expensive to make it is not desirable to reject such castings on account of defects which can be remedied. Minor leaks in a casting may be stopped by peening, which, however, they consider to be a questionable method of treatment. For very small defects they prefer to drill, and then to screw in plug of the same metal as the casting. If this is not practicable the defective portions should be cut out by chisel or drill till all the defective metal is removed and the cavity then filled by pouring in metal from a crucible in such a way that the entire surface of the cavity is melted, and then consolidated by the added metal. If a gas flame is used for this there is a risk of the filling not being solid, besides the possibility of oxidation. When this method adopted the cooling of the metal will be accompanied by contraction, which sets up severe tensile stresses in the added metal and in its surroundings. Further, the rapid cooling of the added metal makes its elastic limit higher than that of the neighbouring portions. The state of tension so set up may be so severe that after a time cracks will appear. The stresses may be lessened by keeping the casting heated to a high temperature while the repair is being made, but the best way to prevent cracking is to anneal the casting immediately the repair has been made. The annealing temperature should be maintained for several hours, so as to give the metal time to flow. This, they say, is the only way to insure safety in castings in which "burning in" has been adopted.

In the *Engineering Record* of August 12, 1914, there appeared a communication from Mr. L. D. Van Aken, the superintendent of the National Brass & Copper Tube Company, of Hastings-on-Hudson, New York, on the subject of the cracking of brass and bronze. He states that the frequency of these cracks has alarmed metallurgists, engineers, &c., and he attributes the failures mainly to what he terms the greed for higher tensile strength, which has led to a disregard for safety. He mentions that the United States Navy has adopted reasonable specifications for the elimination of the trouble. He records some experiments which he had made upon a brass having a composition of copper 61·33, zinc 37·66, lead 0·16, tin 0·83, iron 0·02. (This is very nearly the composition of our well-known Naval brass.) This was first made into an extruded rod 1⅛ in. diam., allowed to cool slowly in the air, and then tested. The result is given as No. 1. The rod was then cold drawn to 1 in. diam., with the result given as No. 2. After this the cold drawn rod was annealed at 1,300° Fahr. for 30 min., and then allowed to air cool; the results of tests in this condition are given as No. 3. A portion of the rod after the same annealing was quenched in cold water instead of being allowed to cool in the air; the results are given in No. 4. Mr. Van Aken states that the annealing as in No. 3 is sufficient to prevent crackage of any description.

No.	Ultimate strength lbs. per sq. in.	Elastic limit lbs. per sq. in.	Ratio of Elastic to Ultimate per cent.	Elongation in 2 ins. per cent.	Reduction of Area per cent.	Hardness Scleroscope.
1	78,800	26,750	16	50·5	58·6	20
2	77,300	70,100	90	27	1·2	25 Surface
3	58,700	27,300	47	53	81·6	5 ·7
4	63,800	29,900	47	48	75·6	20

* Abstract of Introductory Contribution by the author to the adjourned discussion on a paper read by Mr. J. T. Milton (Vice President) to the Institute of Marine Engineers on Tuesday, October 9.

It will be noticed how enormously the cold drawing has affected the tensile strength, and more especially the elastic limit, and that the cold worked material still possesses as much ductility as measured by the extension and by the reduction area as would be shown by a sample of a mild steel forging. Judged from the tensile test, it might be thought to be an excellent constructive material. Its high tensile strength, however, is dearly bought if it is accompanied by the tendency to spontaneously crack. The tests show also that annealing has restored the qualities of the metal to their original amounts.

It is to be noted that Mr. Van Aken only tested extruded rods. In Mr. Flinn's papers extruded rods are mentioned in such a way as to lead to the inference that extruded metal may be received with the same confidence as rolled or forged material. However, no comparative tests are given of the results of the two methods of manufacture. It is extremely desirable that some exhaustive experiments should be undertaken with different compositions of metals to show the effect upon the metal of the different processes, viz., casting pure and simple, forging, hot rolling, extrusion and also cold work, say, by drawing. These tests should include the effects of annealing. They should also include the resistance to repeated applications of stress commonly called fatigue tests. In fact, this kind of test is of greater importance than any other. It is evident that at present there is a lack of knowledge of the physical properties of many of the much used special alloys, although we have been using them for many years for very important structural purposes.

In the same volume of Transactions of the American Institute of Metals, which contains Mr. Flinn's paper, there is another communication by Dr. P. D. Merica and Mr. R. W. Woodward upon "The Failure of Structural Brasses." Dr. Merica is a Physicist of the Bureau of Standards, Washington. In this paper there is a description of some work done in the Bureau of Standards in investigating the causes of spontaneous cracking in brass. The authors consider that failures are due primarily to the presence of internal stresses, and state that manufacturers should endeavour to produce material free from these stresses, and yet possessing the physical properties produced by the mechanical treatment which is responsible for these stresses. They state that it is possible, for instance, to make naval brass practically free from internal stress and yet having an ultimate strength of 60,000 lb. and an elastic limit of from 30,000 to 35,000 lb. per sq. in. The paper gives the results of numerous tests made with samples, some of which were new material, and others of brass which had been put into service. The authors tested these samples for internal stresses by Heyn's method. They state that their results may be relied upon to have a maximum error of not more than 1,000 to 2,000 lb. per sq. in., or 5 per cent. The figures they give showed that all the samples they tested were more or less initially stressed, some of them to an enormous extent. Some of the samples have tension stresses on the surface, and others compression stresses. They investigated the method of testing for initial stress by immersing the samples in solutions such as mercuric chloride, mercurous nitrate, ammonium hydroxide, &c. Cracks were often produced, sometimes in 2 min., sometimes in 24 hours. They found, however, that while those samples which had a high tension on the surface cracked, those which had large compressive stresses did not. This test, therefore, is not a sufficient one to enable defective material to be detected.

The following are the main conclusions arrived at by the author:—

1. Failures occur, so far as is known, only in brass which has been worked, *i.e.*, forged, hot or cold rolled, drawn, or extruded.

2. These failures are independent of composition.

3. The fractures occur, in general, transversely to the direction of working.

4. Failures occur in brass materials which are under initial stresses provided these stresses average over 5,000 to 6,000 lb. per sq. in.

5. These stresses can be almost entirely removed by annealing at temperatures of about 300° C. to 400° C., which temperatures do not affect sensibly the ordinary physical properties.

6. No certain indication of the magnitude, or even the presence, of such stresses has been found in studies of the structure, or of etching or corroding agents.

7. Brass may be manufactured practically free from stresses and still retain excellent mechanical properties, *i.e.*, will not be too soft.

Dr. Merica stated that investigations are being continued at the Bureau of Standards, and invited the co-operation of both manufacturers and users of brass.

It will be noticed that neither in this present communication nor in the former paper has any reference been made to corrosion in general. This is, of course, a very important matter, and so far as condenser tubes are concerned is the subject of research by a Committee of the Institute of Metals, assisted by a Government grant. Without wishing to detract from this very useful work, it is thought that the subject of the physical properties of copper alloys, especially as regards their reliability and their adaptability for use for important structural purposes, is quite as worthy of a thorough research as is that of corrosion.

SPACE AND WEIGHT IN SHIPS.

When iron ships were first mooted, it was thought that they would be too heavy to float in water. It is true that ships can be built of less weight of steel than of iron, but it is rather curious to find that in the ordinary way it is very difficult to load a steel ship down to her "marks," that is to say, the cargo generally fills the cargo spaces before the necessary weight is put on board. This, of course, does not apply to cargoes such as iron or heavy machinery, but with general kinds of cargo, the fact remains that it is the available cargo space in the ship which decides the amount of cargo which should be carried rather than the available weight. The outcome of this is that we have at the present day, ships designated as spar, awning, and shelter decked vessels, all of which run at a load draught less than that permissible with the full scantling ship, or, in other words, at a less draught than would be permissible under the maximum granted by the Load Line tables.

Since the stresses of a ship vary as the draught, it follows that a ship can be built with smaller scantlings than she would have if running at the maximum permissible draught. In consequence, spar, awning and shelter decked vessels are built to lighter scantlings. This reduction of draught does not apply with such great force in slow speed vessels built principally to carry cargo. On account of their slow speeds they can be given very full under-water form. The space occupied by machinery is small, and no space being occupied by passengers, there is a good deal available for cargo. As a result, a sufficient weight of cargo can be carried to load them down to the maximum permissible draught. In faster vessels, for economical propulsion, the lines are made finer, which, together with the increased weight of machinery, results in the carriage of a less weight of cargo. The cargo space, however, is so much reduced that it becomes the deciding factor in fixing the draught of the vessel. This has been responsible for the load draughts of vessels being fixed by the owners and described as the owners' maximum draught, which in some cases is even less than the draught could be with the reduced scantlings of the steel. In getting out a new design, special attention should be paid to this matter, and the average density of the cargo should be taken into consideration in deciding on the relation between the cargo space and deadweight. If this is not done, the ship will in some instances not be able to use her space, and in others her deadweight, more generally the latter, to the fullest advantage for cargo carrying.

GENERAL NEWS SECTION.

PERSONAL.

Mr. William Badco, a Cardiff shipowner, has presented £500 to the British Red Cross Society in commemoration of his 25th wedding anniversary.

Mr. John S. Baillie, late of the Secretary's Department of Harland & Wolff's, has received a commission in the Royal Navy as Assistant Paymaster.

The Right Hon. Andrew Fisher, High Commissioner for Australia, has returned to London after an extended visit to shipbuilding and munition works in Scotland.

Mr. David Garbutt Pinkney, senior partner in the firm of David G. Pinkney & Co., shipowners and shipbrokers, whose death occurred on October 10, left estate valued at £14,853, with net personalty of £13,066.

Captain John C. West, who has been taken prisoner by a German submarine after his ship was sunk, is a Belfast man. He served for 29 years with the Lord Line (Irish Shipowners' Company, Ltd.), and transferred last March to the Levant Line.

The death has taken place of Captain Thomas Roberts, Cardiff, at the age of 67 years. He was one of the oldest Masters in the service of the Shamrock Shipping Company, having held command for about 38 years. Latterly he acted as Shore Superintendent for his firm.

At the Cardiff Mayoral banquet last week the retiring Lord Mayor, Alderman Stanfield, announced that he had received a cheque for £2,000 from Captain W. R. Smith, shipowner, towards a fund for establishing a nautical school at the Cardiff Technical College.

Handsome cups have been presented on behalf of the Swedish Government to Coxswain George Cromarty and Second Coxswain Thomas Kyle, of the No. 2 Lifeboat at Holy Island, together with £2 each to the other members of the lifeboat's crew, in recognition of the gallant rescue they effected of the crew of the Swedish barque *Jolani* in November, 1916.

For gallant conduct when the Union-Castle liner *Gloucester Castle* was torpedoed last March, Captain E. J. Holl, the commander, was recently awarded the Distinguished Service Cross by His Majesty the King. Mr. J. Vyvyan Watson-Black, chief officer, and Mr. H. M. Black, chief engineer, were mentioned in the *Gazette* for their services on the occasion.

The death has occurred at Swansea of Commander W. H. Niles, R.N.R., R.D., Commandant of the Port of Gibraltar. He was formerly dockmaster at Swansea, but about 13 years ago was appointed Captain of the Port of Gibraltar, where he was a Justice of the Peace. He was also a Trinity House Brother. Commander Niles sailed for many years from Swansea in the copper ore trade. He was decorated by King George for helping to rescue the passengers of the P. & O. steamer *Delhi*, amongst whom was the Duchess of Fife.

Captain Nevile Richard Sayers, whose death has occurred at Monkseaton, Northumberland, at the age of 72 years, was for many years a Master in the employ of the British India Steam Navigation Company, and traded regularly to the Far East. A clause in the deceased's will read:—"If at the time of my death I shall have a pony and trap, I direct that such shall be sold and the proceeds given to the Jack Cornwell V.C. Memorial Fund." The "turn-out" was duly handed over by the executors to a Newcastle auctioneer and it was disposed of by public competition for the benefit of the object named.

The death has taken place of Mr. Robert Allen, a well-known Liverpool pilot, who retired into private life two years ago owing to ill-health. Mr. Allen in his early business career was the specially appointed pilot to Cammell Laird & Co., and took charge of many noted vessels when out on their trial trips. In 1898 he joined the Pacific Steam Navigation Company, and took their big mail boats as far as Lisbon.

For the third year in succession the partners in the shipowning firm of Lunn & Maccoy have been elected as the Chief Magistrates of Newcastle and Gateshead respectively. As Lord Mayor of the former town, Mr. George Lunn has done a vast amount of valuable work; he has, however, resigned his seat as a shipowners' representative on the Tyne Improvement Commission. At Gateshead, Mr. Maccoy has been no less successful, and, apart from his Mayoral duties, he finds time to represent the borough on the Tyne Improvement Commission and the shipowners on the Tyne Pilotage Board, and he is also a member of the Management Committee of the North of England Steamship Owners' Association.

The closing ceremony connected with the Lord Provostship of Sir Thomas Dunlop, Bart., took place on November 5, at Glasgow, and appropriately took the form of the presentation of his portrait to the city, Lady Dunlop receiving a replica. The portrait is the work of Mr. George Henry, A.R.A. Tribute was paid to the great services rendered to Glasgow by Sir Thomas during his Lord Provostship. There was a large and representative gathering, and it was stated that Sir Thomas was the 10th Lord Provost since the Municipal Buildings were opened 28 years ago. The record of Sir Thomas Dunlop had no parallel in the history of the Corporation, and he would be remembered as one of the most hard-working Lord Provosts that Glasgow had ever had. In addition to his strenuous war services as Lord Lieutenant of the County of the City, he had been foremost in every form of work that tended to improve social conditions.

DEVELOPMENT OF THE FORTH AREA.

Shipbuilding and Shipping Facilities.

The report relating to the trade of the seaports on the Firth of Forth, which has just been issued, is of more than ordinary interest. It has been prepared primarily with a view to bringing under the notice of the Government the facilities for docking, shipbuilding, ship-repairing and other work as they at present exist at the various ports on the Forth. The report also contains information regarding the suitability of the different localities for the establishment of new industries, or the extension of those already in existence. The preparation of the report was undertaken by a committee consisting of representatives of the municipalities of Leith, Bo'ness, Grangemouth, Alloa, Inverkeithing, Burntisland, Kinghorn, Kirkcaldy, Buckhaven, Methil, and Innerleven.

In dealing with the port of Leith details are given of the dock and harbour accommodation, and of the great extension eastward and westward of the harbour entrance, powers for which were obtained, but the carrying out of which has been postponed till the close of the war. There is a list of the principal manufacturing trades, and those which appear to be capable of expansion in the near future if the requisite fundamental facilities are provided. In this connection it is stated that many of the trades are of such a character that, while at present fully occupied on war requirements, there is a great future before them after the war, provided they are put in

a position to take advantage of the demand. They are mostly of a nature not obnoxious to the community. Leith has great facilities for importing, exporting and distributing commodities of all kinds, and the neighbourhood is well suited for every class of manufacture on a scale much greater than it possesses at present. The greater use of modern tools for the manufacture of war material has somewhat increased the power of the engineering trades generally, but there is still great scope for the introduction of modern plant. It is a fundamental requirement of successful manufacture that the ratio of capital expenditure to output be kept as low as possible. One way of arriving at this is the provision of power on a large scale, so that, instead of having to expend capital on individual and relatively inefficient power plant, the various trades could draw their supply of gas or electric power from central stations at a lower rate than that at which they themselves could produce it, and much lower than pre-war or existing power rates. To gain full advantage of the by-products, the production of power should be on a large scale at the coal-fields where there is a large supply of low-grade fuel, which could be most readily treated on the spot. This would avoid the use of sites in and about the towns, which are of much greater value for industrial purposes, and it would largely do away with the smoke nuisance. Attention is drawn to the possibilities of expansion in the fishing industry and allied trades.

In a supplementary statement with regard to the development of the area below the Forth Bridge, the principal matters dealt with are the proximity of valuable coal fields, and the existing facilities at Leith for the docking and repair of warships. The suggestion is made that the communities should combine on a larger scale than hitherto to encourage the provision of the facilities fundamentally necessary to the development of trade and manufacture.

In dealing with the Bo'ness and Grangemouth districts, the shipping and shipbuilding facilities are specified, and it is urged that if the extensive mud flats between the two ports were reclaimed there would be many hundreds of acres available for works of all sorts, including shipyards and steel works. The communities favour the establishment of a Conservancy Board for the Forth area. Similar statements are made with regard to most of the other ports in the group. In a supplementary statement dealing with the development of the area above the Forth Bridge the proposals are summarised as follows:—

1. The reservation of a residential and non-industrial area between Carriden and Port Edgar, and the use of Blackness as a site for a new local garden city opposite Rosyth.
2. The establishment of a ferry from Fife to Blackness, and another from Crombie to Bridgeness for passenger traffic.
3. The construction of a new road and tramway to Phillipstoun station on the Edinburgh and Glasgow Railway.
4. The construction of a new shore road from Blackness to Carriden for access to Bo'ness.
5. The establishment of a Forth Conservancy to dredge the channel, reclaim foreshores, and promote the riparian industry of the estuary.
6. Prohibition of the further deposit of dredgings in the estuary above the bridge.
7. Introduction of the manufacture of basic iron and steel by the use of Lapland iron ore.
8. Establishment of shipbuilding between Bo'ness and Grangemouth on a large scale.
9. Development of mineral working of coal, limestone and fireclay, and the establishment of firebrick manufacture near Bo'ness.
10. Extension of agricultural ground by foreshore reclamation

FORTHCOMING EVENTS.

Institution of Civil Engineers.—Tuesday, November 20, meeting at Institute, Great George Street, Westminster, S.W., at 5.30 p.m. Sir Robert Richard Gabe, K.C.I.E., M.Inst.C.E., on "The Hardinge Bridge over the Lower Ganges at Sara."

Institution of Electrical Engineers.—Thursday, November 22, meeting at the Institution of Civil Engineers, Great George Street, Westminster, S.W., at 6 p.m. Mr. T. M. Hunter, M.A., B.Sc., on "Gas Firing Boilers."

Liverpool Engineering Society.—Wednesday, November 21, at Royal Institution, Colquitt Street, Liverpool. J. B. C. Kershaw, F.I.C., F.C.S., on "Cheap Fuels for Power Generation."

FROM OUR CORRESPONDENTS.

CLYDE AND DISTRICT.

(From Our Own Correspondent.)

Glasgow Harbour Hours.—The dispute with regard to the working hours of dock labourers at Glasgow harbour has been satisfactorily settled. At a joint conference between representatives of the shipowners, stevedores and dock labourers at the port, it has been agreed that the men should be allowed to work during the winter the same number of hours per day as they do during the summer months. In former years it has been customary to shorten the working week at the harbour by five hours, beginning from November 1. This, of course, meant a reduction in the men's pay, and this year they objected to having their earnings cut down.

Increase of Harbour Rates.—In order to meet the increasing expenditure at Glasgow harbour the Clyde trustees have decided to advance their rates by 20 per cent. The main causes of the rise is the additional wages which are now being paid to the staff and the higher cost of all kinds of stores. In the first place a 20 per cent. increase will be made on and after November 19, on such of the rates on goods and for the use of cranes and graving docks as are not at their maximum under the existing statutory powers and the Board of Trade Order, subject to the maximum of 33⅓ per cent. above the statutory maximum. A similar increase will be made on the rates and charges for Meadowside granary and for the use of tramways and capstans at the harbour.

Fire Risks at the Harbour.—Mr. W. Rowan Thomson, Deputy Controller of Auxiliary Shipbuilding, has called the attention of the Clyde trustees to the risk of fire from the prevalence of smoking among workmen in sheds at the harbour and on board vessels fitting out. Mr. Thomson asks that measures be taken with a view to putting a stop to the practice. This is a matter of considerable importance to all concerned, as serious loss has been caused in past years from fires which have broken out at the harbour, some of them being traceable to the parctice of smoking among workers. It is, however, a very difficult matter to deal with effectively. In reply to Mr. Thomson's communication the trustees resolved to inform him of the special devices and additional precautions recently instituted to detect and prevent fires in sheds, and that representations be made to the Admiralty to deal in co-operation with the shipbuilders and repairers with regard to the practice of workmen smoking on vessels fitting out.

Greenock Shipyard Extension Case.—An undefended action was disposed of in the Court of Session last week, which has an important bearing on the extensions which it was proposed to carry out in the shipyard of Caird & Co., Greenock. It may be recalled that Caird & Co. proposed some time ago to extend their shipyard and in order to carry out this work they were desirous of purchasing the site of the Old West Parish Church and churchyard, which closely adjoins their yard. An offer was made by the firm to remove the church and churchyard to another site and to re-erect the building as nearly as may be in its present condition. Negotiations were opened with the Church authorities, but nothing definite was done. A short time ago, however, an action was raised in the Court of Session by certain parties against the heritors of the West Parish Church asking for declarator that they (the heritors) had no title to sell or dispose of any part of the site of the church or churchyard in order that it should be converted into part of a shipyard. An interdict was also asked. The pursuers in the course of their claim pointed out that the church and churchyard were of great local interest, and that Burns' Highland Mary and the father and grandfather of James Watt were buried there. No defences were lodged by the heritors, and decree in absence as concluded for was pronounced by the Court.

River Widening at Glasgow.—The Clyde trustees have again under consideration a problem which has given them a good deal of concern for many years. This is the widening of the Clyde in front of Meadowside shipyard. The last time this problem was prominently before the trustees was in 1908, when negotiations were entered into with D. & W. Henderson, but no settlement was reached on that occasion and the matter was allowed to lapse for the time being. The question has again become a pressing one, and after having been considered by the Law and Parliamentary Bills Committee of the Trust, it has been remitted to a special

sub-committee consisting of Mr. J. W. Stewart, Sir Thomas Mason, and Mr. W. H. Raeburn. While it is probable that the actual work of widening the river will be postponed till after the war, the trustees are apparently desirous of concluding the preliminary arrangements now, so that they may be able to undertake the work without undue delay when normal conditions are restored. Within recent years the Clyde has been widened both above and below Meadowside and Pointhouse, and now these places jut out into the river in a way that makes the channel rather awkward for shipping at this point. If any extensive scheme of widening is to be carried out it will probably involve the removal of Meadowside shipyard to a larger site, because to take a slice off the yard at the riverside would mean a shortening of the existing building berths.

SCOTTISH EAST COAST DISTRICT.

(From Our Own Correspondent.)

Ore Rates at Leith.—At a meeting of Leith Dock Commission on Friday last an application was submitted from a large importing concern requesting a modification of the dues on burnt ore. On the recommendation of its Finance Committee, the Commission decided that the outward rate on burnt ore be reduced from 8d. plus 25 per cent. per ton to 5d. plus 25 per cent. per ton.

Peterhead Harbour Affairs. At the annual election of members to Peterhead Harbour Trust last week, Provost Leask, who presided, took occasion to refer to the trade of the port. The revenue of the harbour, he said, had slightly improved during the year This was due to the fact that herrings had been rated on the value per £, instead of per cran. Mr. Catto and Mr. James Wilson, boatbuilder, were re-elected to the Trust, as proprietors' representatives, and Mr. Alex. Webster, timber merchant, as a representative of the harbour ratepayers. A vacancy in the representation of the shipowners of the port has yet to be filled.

Aberdeen Wages Claims.—Some time ago the Aberdeen branch of the National Union of Dock Labourers made application to the Harbour Commissioners for an increase in the wages of the steam and electric cranemen employed at the port. The demand was that the men's wages should be advanced to 9d. per hour for ordinary time and to 11d. per hour for overtime. The Commissioners refused the application and the matter was submitted to arbitration. Last week the arbiter issued his award, which is to the effect that the cranemen are entitled to an advance of 2s. per full ordinary week, and that this advance is to be taken into account in the calculation of payments for overtime. Another class of workmen at Aberdeen, the boiler-scalers, are in dispute with their employers over the interpretation of an award given recently by an arbiter. The men asked for 1s. per day of an increase on their wages. The employers conceded an advance of 6d. per day and offered to refer to arbitration the question of whether a further 6d. per day should be given. The arbiter granted an advance of 6d. The position now seems to be that the employers hold that the 6d. awarded is the 6d. they conceded. On the other hand the men maintain that the award gives them an extra 6d. over and above the one conceded by the employers.

NORTH-EAST COAST DISTRICT.

(From Our Own Correspondent.)

Increased Industrial Activity.—There is every probability of largely increased industrial activity on the banks of the Tees. It is said that in connection with various big undertakings something like £2,000,000 is ear-marked for expenditure on local enterprises after the war. At the last meeting of the Tees Conservancy Board it was reported that applications had been received for the purchase of reclaimed land from Bell Brothers & Co., Smith's Dock Company, Ltd., and the Lackenby Ironworks, and were being considered.

Advance of Wages to Steel Workers.—An application was recently made through the Northern United Enginemen's Association for an advance of wages for men employed at the steel works of Palmer's Shipbuilding Company, Jarrow. The matter was referred to the Committee on Production, and their award has lately been received. A claim for an increase of 1s. per shift was not granted, but, as from the first full pay after October 25, men concerned are to be paid at the rate of time and one-fifth per shift for the five week-night shifts, and the 5s. hitherto paid as war bonus is to be converted into war wage to the men at the rate of 10d. per shift.

Institution of Engineers and Shipbuilders.—Mr. E. W. Fraser Smith, the energetic secretary of the North-East Coast Institution of Engineers and Shipbuilders, Bolbec Hall, Newcastle, continues to make valiant efforts to increase the membership, his "possible" being 4,000, the number of eligibles estimated in the twin industries between Blyth and the Tees. A year ago a plea was put forward for a larger membership, but the results, though fairly satisfactory, were not so good as might have been expected, only 105 new names being added to the roll of membership, which now stands at 1,181. It will be seen, therefore, that there still remains considerable scope for missionary work ere Mr. Fraser Smith's ambition in numbers is reached.

Training of Apprentices.—The value of the North-East Coast Institution of Engineers and Shipbuilders is being demonstrated more and more as the years go by. Last winter session was a particularly helpful one by reason of the practical importance of the subjects dealt with, and since then, as we know, the Institution has prepared and circulated a distinct contribution to the question of the better training of apprentices, which will, it is hoped, "become the basis of educational reforms so far-reaching in their character as to make better workmen and better citizens of the youths now entering the industries." It is also to be noted that the Research Committee has accomplished a great deal of valuable work, and is expected in the near future to issue its first report on the results of the investigations undertaken.

Increase of Port Dues.—All the leading ports in the United Kingdom have had to raise their dues in consequence of diminution of trade resulting from war conditions. As already reported in these notes, the Tyne Improvement Commission increased their charges up to 50 per cent. as from November 1, and at the last meeting of the Commissioners, Mr. Arthur Scholefield, chairman of the Finance Committee, mentioned that many of the river authorities had increased their dues by a figure similar to that on the Tyne. They all realised, he said, that increasing the dues had a detrimental effect on trade; but he thought they would agree that their first duty was to safeguard the financial position of the Commission. No one, we think, can dissent from this policy. The river has to be maintained in an efficient state, even though there be an appreciable falling-off in trade, and the cost of labour is exceedingly high just now. The dues are the source of revenue, and they have had, perforce, to be increased to meet the current expenditure.

Loss of Revenue.—Sir Hugh Bell, Bart., presided at the last meeting of the Tees Conservancy Commissioners, and stated that there was a loss on the revenue account for the past year of £5,300, and that careful estimates of the receipts and expenditure for the coming year indicated that the adverse balance would become about £12,800. It was desirable, therefore, to take steps to meet that deficit. The Tees, Sir Hugh pointed out, was the only port on the North-East Coast which had not made some alteration in the dues in the past three years. It was now considered necessary to make a change. It was recommended by the Finance Committee that the rebates on pig-iron, ore, salt, castings and other goods be withdrawn as from November 21, allowances that represented £7,800 a year. In the discussion on this proposal, it was remarked that the withdrawal of the allowances was not one which would impose a hardship to any great extent upon individuals, but would fall mostly on the country at large. The recommendation was agreed to.

Shipbuilders and Orders from Neutrals.—With the object of creating a larger measure of public interest in the questions of Norwegian shipowners being assisted by their Government to replenish their fleets, the threatened control of shipping and shipbuilding in Holland by Germany and the necessity for our own Government revising its policy as regards shipbuilding for British shipowners, a resolution previously adopted by the North of England Steamship Owners' Association and forwarded to the Chamber of Shipping, and already outlined in these notes, was submitted to the last meeting of the Newcastle Chamber of Commerce and agreed to. A notable contribution to the discussion on the motion was that of Mr. Arthur Scholefield, who referred to the booking of contracts by British shipbuilders for Norwegian owners at £25 a ton, and he asked: Were the shipbuilders to be prevented from building these vessels when in the contract it was agreed that

the ships should not be built so long as any British shipowner wanted a vessel? Mr. Daniel Stephens asked if this latter condition was actually in operation, and Mr. Scholefield said it was in all the contracts he had seen. There is no doubt that this question is going to be a very difficult one in the future, because the British shipbuilder would be less of a business man than we know him to be if he did not seek to make the most of the contracts offering. In Newcastle the effort is being put forward to acquaint the public, as well as the Government, with the position as it is, and may be, in the years to come.

MERSEY DISTRICT.

(From Our Own Correspondent.)

Increase in Lairage Charges.—The Mersey Docks and Harbour Board have decided to increase the lairage charges at Birkenhead both for cattle and for carcases taken in the chilled rooms, as the result of the larger expenditure on wages account. The Chairman of the Traffic Committee asserts that even with this increase, the Board is not compensated for the amount they are expending on the lairages.

Trade After the War.—There is likely to be a strong opposition from Liverpool commercial interests to the Government Bill, the purpose of which is to continue with modification for a limited period after the termination of the war, certain powers in relation to imports and exports. Apart from the Liverpool Steamship Owners' Association's protest against State control of shipping, the Liverpool Chamber of Commerce is demanding that Government interference with trade should cease after the war.

Breach of Contract.—In a claim for breach of contract, heard at the Liverpool Assizes last week for short delivery of cargo carried by steamers of the Yeoward Line, the plaintiffs, W. P. Band & Co., contended that they had always regarded Yeoward Brothers as the owners of the steamers, since all correspondence and documents had borne the signature of "Yeoward Brothers." For the defence, it was urged that on the note paper used in correspondence with the plaintiffs, the names of several limited shipping companies were printed at the top, and that the plaintiffs ought to have been aware that Yeoward Brothers could be acting only as managers of those limited companies. The Judge, giving judgment for Yeoward Brothers, said there was no evidence that that firm had held themselves out to be owners of the vessels. The produce was carried by steamship companies who were separate entities.

Norwegian Chamber of Commerce.—It is worth recording that the Liverpool branch of the Norwegian Chamber of Commerce which was inaugurated a week ago, has already enrolled about fifty firms as members, and many others who anticipate business relationship with Norway have signified their willingness to join. The members so far enrolled are:—Lever Brothers, Ltd.; Mersey Docks and Harbour Board; the Cunard Steamship Company; Colonel J. P. Reynolds; United Alkali Company; Evans Sons, Lescher and Webb, Ltd.; The Salt Union, Ltd.; Canadian Pacific Ocean Services; H. & C. Grayson, Ltd.; Jas. Webster & Bro., Ltd.; Walter Ibbotson, Jun.; Liverpool and District Fruit Buyers' Association; Meade-King, Robinson & Co.; Henry Tyrer & Co.; J. Jackson & Sons; Andrew Nacrum & Co.; Langstaff, Ehrenberg and Pollak; A. Coker & Co., Ltd.; Thos. Rigby & Sons; Japp, Hatch & Co., Ltd.; J. P. McPhail & Co.; Graham, Son & Hay; Harold M. McArthur; W. H. Stott & Co.; McLean and Lawrenson; Silvewright, Boom & Co.; Vogt and Maguire; Williams and Jones; Brodersen, Vaughan & Co.; F. Stevenson & Co.; MacSymons Stores, Ltd.; Vitali and Vaethe; W. H. Rhodes & Son; Brook, Ratcliffe and Potts; Foy, Morgan & Co.; Burnyeat and Dalzell; James Grandidge; E. Wiese & Co.; Johansen & Dahl; Smith and Tyrer; Alfred Dobell & Co.; Acton Grange Timber Company; Duncan, Ewing & Co; Holzapfels Composition Co., Ltd.; E. T. Agins, Ltd.; and Robert Coltart & Co.

Cold Storage Accommodation.—A good deal of interest is being aroused in the position of this port as regards the cold storage accommodation, which is sadly deficient—a fact that seems to be widely known amongst shippers and exporters. The fact seems to have been established that while the existing provision may have been about equal to the requirements of pre-war times, the margin was so small as to be of little value and utility to meet conditions which have arisen since hostilities began. The result has been that cargo shipped to this port for cold storage has for long periods had to lie on the quays, with consequent depreciation in value and loss to those interested, not to mention waste in valuable foodstuffs during the hot summer months. Yet, with these facts known to them, neither the Mersey Docks and Harbour Board nor the City Corporation seem to have so far developed any new provision for the city and port's use, and their apparent apathy is the subject of widespread comment. As far as the Mersey Docks and Harbour Board is concerned, there seems to be just grounds for the complaint that that body is leaving the cold storage provision too much to private enterprise, and that while ample accommodation is made for the ship, there is too little attention given to the cargo. I regret to say that in respect to coal storage facilities, the Mersey port is compared very unfavourably with other shipping centres which have nothing like the import trade that Liverpool has, and unless the Docks Board tackles this problem in earnest, and immediately, the port will suffer almost irretrievable injury. Experts point out that some relief could be afforded by insulating several of the sheds and warehouses on the dockside, on lines that have already been adopted by one or two shipping companies in Liverpool.

SOUTH WALES DISTRICT.

(From Our Own Correspondent.)

Trade of Swansea Harbour.—The official returns of the Swansea Harbour Trust for the month of October show that imports amounted to 45,480 tons, and for the past ten months of the present year they totalled 427,814 tons. The figures for the corresponding periods last year were 58,320 tons and 582,174 tons. Exports last month were 300,847 tons, and for the first ten months of this year 2,972,864 tons. Last year in the same periods they were 325,229 tons and 3,952,378 tons.

Food Economy Campaign.—Sir Arthur Yapp addressed the members of the Cardiff Coal and Shipping Exchange on Thursday last, when a resolution was adopted pledging the members to do all in their power to promote the object of the National Food Economy League. Mr. R. O. Sanderson, as representing the Shipping Section of the Exchange, said that but for the courage and heroism of the officers and men of the Mercantile Marine this country would have gone very short of material requirements.

Cardiff Shipbuilding Scheme.—Speaking at the luncheon given by the new Lord Mayor at Cardiff, on Friday, Alderman F. G. L. Davies said he was in London on Thursday, and was there authorised to make the following statement on the Cardiff Shipbuilding scheme:—"This business is now in the hands of first-rate people in London and the North, and they hope to bring matters to a successful issue as soon as possible. They have been promised by the landlords of the district land on very favourable terms for the erection of houses for the workers."

Newport's Scheme for Training Sailors.—The proposed scheme for providing facilities for training boys for the Mercantile Marine was again before the Newport Education Committee, when Mr. Pardoe Thomas, shipowner, expressed the hope that no scheme would be adopted unless the committee had the support of the shipping community. The chairman said that at present men who sat for their mate's, master's and extra master's certificates had to go to school at Bristol or Cardiff, and it was felt that at Newport they might have a school for boys and adults. The grant was £10 per pupil, and the Committee felt that such a school could be established without unduly burdening the rates.

Swansea as an Oil Centre.—Operations have been commenced in connection with the scheme of the Anglo-Persian Oil Co. for establishing a large oil-refining and store depôt at Swansea. Preparations for constructing the necessary tanks, buildings, and pipe lines from the Swansea Docks, where the oil will be imported, are already in progress. It is expected that the importation of petroleum will reach very considerable proportions, and that the processes at the refinery will place at the disposal of the company a large and increasing supply of petrol, while it is also intended to establish a service of oil-fuel for oil-driven steamers. Swansea is guaranteed a minimum revenue of at least £30,000 during every three years in respect of site, rates, and harbour services. The Anglo-Persian Oil Co. holds the option of paying this amount in such annual proportions as it may decide, but it is hoped that once the business has been properly established the revenue to the Harbour Trust will exceed an average of £10,000 per annum.

Cardiff Shipbrokers' Institute.—Mr. S. W. Hansen, presiding at the first annual meeting, said the Institute was of great importance

to shipbrokers generally. When the war broke out—and since then they had seen many changes—shipbrokers had a most strenuous time, and their employment had been very considerably decreased consequent upon various Government restrictions. They were all looking forward to the restoration of normal conditions of working, and when that time did come it was to be hoped that shipbrokers would be able to conduct their business without resorting to over-competition, which had been so prejudicial to their interests in the past. Mr. Hansen said that donations amounting to about £6,800 had been subscribed to the benevolent fund, which the committee hoped would reach £10,000. He appealed to the principals of firms to subscribe to the Institute on behalf of members of their staffs who were now with the colours, so that when the latter returned they would be members of the Institute and entitled to participate in the benefits derivable from the Benevolent Fund. Mr. J. W. G. Cox pointed out that when normal times were restored it would be possible, through the instrumentality of the Institute, to prevent ruinous competition and fix on a scale of brokerage which would be adequate and fair.

It is not proposed to hold monthly meetings, but whenever any matter of importance arose the members would be called together.

BELFAST DISTRICT.

(From Our Own Correspondent.)

Increased Wages.—The award of the Committee of Production giving 5s. per week advance to the men in the local yards and shops has for the present satisfied them, but if previous experience is any guide it will not be long before another application is in. This advance dates from the first pay day in December, and will apply to the undermentioned societies in the service of Harland & Wolff and Workman, Clark & Co.:—Amalgamated Society of Engineers, Ironfounders, Boilermakers, Smiths and Strikers, Blacksmiths, Steam Engine Makers, United Machine Workers, Workers' Union and N.A.U.L.

Improvement of Shipyards.—A number of questions were asked in the House of Commons last week with reference to the establishment of a national yard in Ireland. The general tenour conveyed an insinuation that Ireland was being overlooked in the direction of Government work. Yet this is far from being the case. Ministerial replies were to the effect that there is not at present any intention of establishing national shipyards in Ireland, as it is considered that the object can be best obtained by improving existing yards and encouraging private enterprise. I understand that effective steps in this direction have been taken as far as Belfast is concerned, and while it is not advisable yet to disclose what has already been done, it will be found that the city will be a great gainer. I hope to make an announcement on the subject shortly when the time is ripe for doing so.

THE FREIGHT MARKETS.

(From Our Own Correspondents.)

London.—Chartering business on the Baltic Exchange is still restricted for all trades. The demand for tonnage is, however, very strong, and high rates are offering, especially from the East and America. There is no change in the position of the River Plate market, rates being nominal and unchanged at 145s. from the up river ports and 140s. for down river loading. From the ports of the North American Atlantic seaboard the demand continues good for vessels on net form of charter, the rates being 230s. to the United Kingdom; 260s. to France, and 360s. to Italy. For Gulf loading an additional 30s. can be had. Better figures are to be had for heavy grain, which is worth 40s. to this country and 5s. more to France. Coal cargoes from Virginia to the River Plate offer at 125s., to Rio de Janeiro $32, and Santos $34. Sugar can be worked Cuba to France at 290s., and nitrate at 185s. to the United Kingdom, or 200s. Italy. The East is still badly in need of tonnage, for which big figures are to be had. Bombay to this country would pay 280s. and 400s. to the Mediterranean on deadweight, and Karachi 250s. to the United Kingdom on scale basis. The Madras Coast is open to take up tonnage at 550s. for kernels to Marseilles, and from the rice ports 600s. is to be had to this country or France. In the Mediterranean section of the market the ore and phosphate ports are steadily taking up tonnage on the basis of 45s. Huelva to the Mersey, 50 frs. Bilbao to Boulogne, 60s. Huelva to the East Coast United Kingdom for pyrites, 50s. Bougie to the Clyde, and Tunis 65s. to the same destination, while Sfax to the Bristol Channel is worth 70s. In the Bay trade rates are indicated by fixtures at 22s. Bordeaux to Bristol Channel.

Glasgow.—There is still an urgent demand for tonnage in the local market, but the supply falls considerably short of requirements, and firm rates have ruled in all directions. In the shorter trades a few fixtures homewards were reported, among them being, Bayonne (2,000), Bristol Channel, 23s. prompt; Bordeaux (1,000), Bristol Channel, 22s. prompt; and a time charter for a handy neutral steamer for the Spanish and United Kingdom trade on a basis of 24s., onions. In the longer trades the following fixtures were reported: nitrate ports to the United States (Atlantic ports), $25 (fixed recently); New York (4,100), Liverpool, 23s., net form November-December; time charters—general trades (8,800), 41s. 6d., 12 months; States and West Indies (2,500), 35s., one round trip, delivery and re-delivery north of Hatteras; States and West Coast South America (4,500), 42s. 6d., one round trip, delivery New York, re-delivery north of Hatteras. Sailing vessel, Rangoon to Havana (2,500), 280s., February-March.

Newcastle-on-Tyne.—The shortage of shipping on offer in the local freight market during the week under review has been so acute, the arrivals of stemmed tonnage have been so poor, and the official demand for coal has fallen off to such an extent, that the position of the local coal trade has gone from bad to worse. Many collieries in the counties have been laid idle; many others have had to be content with short-time working. At the time of writing, stemmed tonnage is arriving in rather better volume and the acute depression in the mining industry will, at all events, be mitigated to some extent, although much more shipping is needed. The amount of chartering done is very small indeed. Business has been most brisk from Swedish ports, about 10,000 tons of shipping having been taken up from that direction. Rates from Gothenburg and Stockholm have very little altered on the week, the former port having been done at from 185 kr. to 190 kr. and the latter at from 195 kr. to 200 kr. Coasting business is idle at about 20s. 6d. quoted. There is nothing doing from the Spanish Atlantic ports, although 160s. from Bilbao or Santander could easily be repeated. Chartering from Portugal is neglected, albeit 95s. is quoted from Lisbon and 105s. from Oporto. Gibraltar is still mentioned at 100s. Rates from the Spanish Mediterranean have made another upward bound, Barcelona having been fixed from 275s., as against the previous record rate of 262s. 6d.

Liverpool.—The demand for outward tonnage on this market continues active, with rates firm all round, and higher values indicated to neutral ports. Business done is, however, limited to the few boats that daily become available. Time boats are keenly inquired for, and very tempting rates are obtainable by neutrals. One such has been fixed in the French coal trade at 58s. for 12 months, charterers paying a war risk; while a 5,000-ton vessel in the general trades made 43s. 6d. for 12 months' engagement. Homeward freights are quiet but very firm, and in many trades tonnage is keenly inquired for. Eastern markets are still neglected, notwithstanding that rice ports are offering higher rates, 600s. being indicated to either France or the United Kingdom. Mediterranean, homewards, is offering attractive rates for fruit ships, and up to 27s. 6d. per case paid for oranges and 24s. per case paid for onions, prompt. North American freights are firm and fairly active, especially for grain, which quotes 40s., Range to the United Kingdom, 45s. to France and 70s. to Italy, whilst net charters continue to quote 230s. to the United Kingdom, 260s. to French Atlantic and 360s. to Italy from Range ports, with 30s. more for Gulf loading. River Plate remains dull at 145s. from up-river ports.

Cardiff and Swansea.—Business continues on quiet lines on the outward coal freight market. The tonnage position remains unsatisfactory. Rates for neutral destinations remain strong. There have been inquiries on the market for tonnage for Norwegian, Spanish and South American account, but no transactions were recorded. The following fixtures were reported for France:—St. Malo, 45s. (neutral); St. Malo, 21s., option Cherbourg, 23s. 6d. (allied); Caen, 48s. (neutral); Honfleur, 48s. (neutral); Fécamp, 48s. 9d. (neutral); La Pallice, 61s. 6d. (neutral); Rouen, 74s. 3d., coke (neutral); and Nantes and St. Nazaire, 61s. 6d. (neutral), these two fixtures being for Newport loading. The only other business recorded was Dakar at 85s. There has been extremely few transactions concluded on the Swansea market. A keen inquiry was in evidence for all directions, and full rates continue

to be quoted, but business is retarded owing to poor tonnage supplies. French ports were represented by the following fixtures:—Rouen, 48s. 9d.; St. Servan, 43s. 6d.; and La Pallice, 61s. 6d., for neutral vessels in each case.

Hull.—The market has a firm tone all round with a good all round demand for tonnage, especially for France. The North French demand is very firm with a keen general inquiry from all the group of ports, and a moderately good business is passing in both sail and steam. In the West Italian market only a quiet trade is doing. The neutral markets are neglected.

THE COAL MARKETS.

(From Our Own Correspondent.)

The coal markets at the chief coal exporting ports evince a very quiet tendering and, generally speaking, more coal is being produced at the pits than can comfortably be got rid of. Even large steam coal is for the time being in slow demand, while smalls of all descriptions are without movement and stocks are being accumulated at a far greater rate than owners like.

The effect of the slack demand has been to cause stoppages at many pits, and at others short time is being worked. The dullness of trade is accentuated by the shortage of rolling stock on the railways, and South Wales especially is feeling the pinch rather acutely. Inquiries are not numerous and new business has been rather conspicuous by its absence. There is, however, still a strong inland demand, which, though it does not make up for the absence of export business, takes a good deal of coal off producers' hands. The colder weather has quickened the trade in household fuel, and patent fuel also sells briskly.

The bunker coal trade is depressed owing to the lessened movement of shipping. On the North East Coast, Durham bunkers are rather a drug in the market, and all descriptions are freely offered at the official minimum prices. Best bunkers are quoted at 24s. to 27s. 6d. and ordinaries at 26s. Of specials the supply is not too large and cargoes of this description for export command 30s. The South Wales bunker trade is likewise dull and best bunkers are worth no more than 22s. 6d., and ordinaries 18s. to 21s. 6d., these figures being, of course, subject to the recent increase of 2s. 6d. a ton to meet the war wage increase.

A feature of the North East Coast coal trade has been the strong demand for smalls for home use, and the quantity absorbed has been for the time being so large that there has been little left for export. Thus, while the official minimum price is 30s. to 30s. 6d., Neutrals are readily paying 32s. 6d., and probably 33s. 6d. could be obtained. For best steams the demand is no more than steady and the quantity available is more than adequate to supply requirements. The same remark applies with even greater force to second quality steams, but Durham gas coals and household fuel is readily taken up.

Prices are approximately, for best Blyth steams 30s. to 32s. 6d. and smalls 18s. 6d. to 20s. 6d.; Tyne primes 29s. 6d. to 32s. and smalls 18s. 6d. to 23s.; second steams 25s. 6d. to 30s. and smalls 18s. 6d. to 20s. 6d.; unscreened steams 24s. to 25s.; North Northumberland steams 28s. and smalls 20s.; smithies 25s. to 30s.; peas and nuts 30s. to 30s. 6d.; Durham gas coals 23s. 6d. to 30s.; coking coals 17s. to 25s.; house coal 20s. to 22s. 6d.; bunkers 24s. to 27s. 6d. and specials 30s.; foundry coke 42s. 6d. and blast furnace coke 35s. 6d.

On the South Wales coal markets only a small amount of business has been doing. Only a few inquiries were to hand and these for small quantities, and as stocks at all the pits are large, owners find great difficulty in keeping going. Smalls are much too abundant, though large steams move off fairly well owing to the large takings by the authorities. The inland demand has been strong for bituminous coals, and nuts have also moved off very well. Coke is a very good market.

The following are approximately the quoted prices, which are subject to the war wage increase of 2s. 6d. per ton:—Best large steams 33s., seconds 30s. 9d. to 31s. 6d., and ordinaries 30s.; drys 28s. 6d. to 30s.; small steams 18s. to 22s. 6d.; best large black veins 30s.; Western valleys 29s.; Eastern valleys 28s. to 29s.; nuts 28s. 6d. to 30s.; peas and beans 26s. 6d. to 27s. 6d.; duff 14s. to 18s.; house coal 30s. 9d. to 33s.; No. 3 Rhonddas 30s. 9d. for large and 20s. 6d. for smalls; No. 2 Rhonddas 27s. for large and 17s. to 19s. for smalls; patent fuel 30s.

There has been no change in the position on the Hull coal market, which has a very strong tone owing to the large takings by the authorities and the very large and sustained inland demand. Inquiries are plentiful; indeed, so much so, that the collieries are unable to supply all the requirements. Official prices are fully maintained and the quantity of free coal coming on the market is almost nil. For best steams for Allied destinations 30s. is the quotation, while Neutrals are charged 35s.

The Scottish coal markets are characterised by the same depressing features as have marked them during the last few months. The export trade is no better though the inland demand is well kept up. Conditions are far from steady, and with the exception of house coal there are few inquiries. In Fifeshire, best steams and navigations are fairly well taken up.

Prices, subject to the additional 2s. 6d. war wage increase, are for splints 28s. to 30s.; Hartleys 29s.; Ells 26s. 6d. to 28s.; screened navigations 28s. to 30s.; steams 27s. 6d.; unscreened navigations 23s. 6d. to 25s., and nuts 21s. to 23s.

The Liverpool coal market is suffering from a hold up of wagons on the railways, which has followed a falling off in the demand for steam coal for export. There is consequently plenty of coal of all descriptions to be had at short notice and collieries would be glad of orders.

The Midland markets continue to exhibit a brisk time and a large amount of business is passing, as the manufacturing and munitions centres absorb all the fuel that they can obtain. Not only is the steam coal position strong, but the house coal trade is very brisk. Any fuel which comes on the market outside contract requirements is assured of a ready sale.

Fair supplies of fuel are reaching the London markets, but merchants could take much more. The best class of house coal is rather scarce and consumers are unable to get all the supplies they need. Steam coal is in good demand, which is only moderately supplied.

COMPANY MEETINGS.

London Maritime Investment Company, Ltd.—The annual general meeting was held on November 8 at Winchester House, Old Broad Street, under the presidency of Sir Owen Philipps, K.C.M.G., M.P., the chairman. The Secretary (Mr. F. Vernon Thomson) having read the notice convening the meeting and the auditors' report, the Chairman, Sir Owen Philipps, K.C.M.G., M.P., in moving the adoption of the report and accounts, said that the paid-up capital of the company was £350,000, of which one-half was 5 per cent. cumulative preference stock and the remainder ordinary stock. There were no debentures. The net profit of the company for the year ending September 30, 1917, amounted to £26,214 (as compared with £21,944 for the previous year), to which must be added the balance of £2,250 brought forward from last year, making a total sum available to be dealt with of £28,465. After providing for the dividend upon the preference stock and adding £11,680 out of revenue to the reserve fund (in addition to £8,319 balance of surplus arising from the sale of securities during the year), the directors recommended a dividend upon the ordinary stock of 6 per cent. for the year, less income tax, carrying forward the slightly increased balance of £2,347. Pursuing the board's policy of building up a substantial reserve fund, as making for the welfare of the company, besides being in the best interests of the permanent investing stockholder, the reserve fund had been increased during the period covered by the accounts to the substantial sum of £70,000. The reserve fund was kept quite distinct from the ordinary investments of the company, and, as would be seen from the published accounts, consisted of £75,000 British War Loan stock. The printed accounts set out very clearly the position of the company. Read in conjunction with the statement in the directors' report, to which he specially drew attention, as to the aggregate value of the company's investments at September 30, 1917, it would be seen that the capital and reserve fund was more than intact. In these times stockholders could regard this as an eminently satisfactory position, and he thought it would compare well with most investment companies in the City of London. As already pointed out, the company had no debenture debt, and, in view of its strong financial position, could face the future with confidence. Largely interested as they were in shipping, he wished again to express appreciation of the inestimable services of the personnel of the Royal Navy and also of the Mercantile Marine. The position of the company being so satisfactory, he did not think it was necessary to make a long speech.

Mr. Geoffrey Dodd seconded the resolution, which was agreed to.

COMPANY REPORTS AND DIVIDENDS.

P. & A. Campbell, Ltd. The directors have paid an interim dividend at the rate of 10 per cent. per annum, free of income-tax.

Framnaes Mek. Verksted, Sandefjord.—The net surplus for 1916-17 is £42,400, from which a dividend of 12 per cent. is declared.

Griffiths-Lewis Steam Navigation Company, Ltd.—The directors (J. C. Gould & Co., Ltd., managers) have decided to pay the postponed dividend, declared on August 9, of 7½ per cent. per annum, free of income tax.

Western Counties Shipping Company, Ltd.—The managers (Edwards, Hepburn & Co., of Cardiff) have paid a final dividend for the year 1916-17 of 1s. 6d. per share, making, with the previous payment, a total of 10 per cent., free of income tax, for the year.

Kolberger Dampfschiffs A.G.—This company went into liquidation last year and, thanks to the favourable sale of the ss. *Kolberg*, it is now able to pay out its shareholders at 183 per cent. (*i.e.*, £8,060 on the share capital of £4,410).

Royal Mail Steam Packet Company.—The directors have resolved to pay an interim dividend for the half-year ended June 30 last, at the rate of 5 per cent. per annum (less income tax) on the preference stock, and an interim dividend at the rate of 4 per cent. per annum (less income tax) on the ordinary stock, the same as in the last two years. Dividend warrants will be posted on November 16.

Adelaide Steam Ship Company, Ltd.—The report shows that increased profits were earned during the year ended June 30 last, the net profits being £77,504, as against £71,531 in 1915-16. In March last an interim dividend of 1s. per share was paid, and a similar distribution in respect of the latter part of the year has been declared. £50,000 has been added to the provident fund.

Peninsular & Oriental Steam Navigation Company.—The directors, after providing for the usual dividend of 5 per cent. per annum on the preferred stock, less income tax, recommend a dividend on the deferred stock of 6 per cent. for the six months, together with a bonus of 6 per cent., both free of tax, making with the interim dividend of 6 per cent. paid in May, a total distribution on the deferred stock of 18 per cent., the same as for the previous year. Dividend warrants will be posted on December 17.

Nuscke & Co., Schiffswerft, Kesselschmiede, &c., Stettin.—The report for 1916-17 shows a manufacturing profit of £57,100 (£37,600 last year). Suitable allowance has been made for depreciation and a dividend of 7 per cent. declared. The share capital is to be increased from £98,000 to £147,000 by the issue of 1,000 bearer shares at 125 per cent. Present shareholders may apply for one new share in respect of each two now held. The company is fully occupied for a long time ahead.

Reiherstieg Schiffswerfte u. Maschinenfabrik, Hamburg.—A dividend of 8 per cent. has been declared for 1916-17 (compared with 6 per cent. for 1915-16). The annual report comments upon the acquisition of the J. H. N. Wichhorst yard (for which a capital increase of £49,000 was undertaken) and the absorption of several other small concerns adjoining the Reiherstieg yard. The latter will, therefore, "be able to carry out its extensions as soon as possible." Plenty of orders are in hand for the next year, and the dock equipment is fully occupied. After deducting expenses, including repairs to building equipment, tools and docks, there is a surplus of £81,000 (£48,500 last year), which is distributed as follows:—Depreciation, £55,200 (£30,600 last year); income-tax reserve, £245 (£1,220); reserve, £1,245 (£834); share to *Aufsichtrat*, £1,200 (£490); dividend, £21,500 (£14,700); carried forward, £1,620 (£650). The balance sheet shows:—Buildings, &c., £481,000 (£473,000 last year); stocks of material, £94,800 (£50,400); debtors, vessels under construction, &c., £448,000 (£326,000); share capital, £295,000 (£245,000); creditors, £509,000 (£389,000).

Lambert Bros., Ltd.—The directors in their report for the year ended June 30, 1917, state that the profit, including the amount brought forward, is £264,061. After providing for the managing director's remuneration, directors' fees, the preference dividend for the year and the interim dividend on the ordinary shares paid in March last, there remains a balance of £213,561, out of which the directors have placed to reserve account the sum of £90,000, and propose to pay in respect of the year a further dividend at the rate of 7 per cent. on the ordinary shares, together with a bonus of 12½ per cent. thereon (both less tax), carrying forward £26,061. Profits and dividends paid on the ordinary shares for the past five years compare as follows:—

Year ended June 30.	Profits. £	Ordinary dividend.
1913 ...	98,726 ...	15 per cent.
1914	76,807	10 ,,
1915	134,798	20 ,,
1916	166,496* ...	25 ,,
1917 ...	240,666* ...	122½ ,,

* After providing for depreciation and all contingencies.
† On increased capital, equal to 37½ per cent. on the old capital.

BIG SHIPPING DEALS.

Rumours have been in circulation in Cardiff shipping circles for some time past regarding contemplated and concluded shipping deals. Two transactions can now be recorded as completed. These are in connection with the well-known Cardiff firms, J. C. Gould & Co. (steamship managers), Ltd., and W. R. Smith & Son.

J. C. Gould & Co., who are the managing owners of the Dulcia Steam Shipping Company, Ltd., The Haenton Steam Shipping Company, Ltd., and the Griffiths-Lewis Steam Navigation Company, Ltd., have purchased from the Fargrove Steamship Company, Ltd., of London, the managing owners of which are Farrar, Groves & Co., Ltd., a fleet of nine steamers, possessing a deadweight capacity of something over 60,000 tons. The average age of the vessels is about eight years. The purchase price is not disclosed, but it is understood to represent close upon £1,000,000, or about £15 or £16 per ton dead weight.

The vessels acquired are:

Name.	When built.	Tons gross.
[illegible]	1905	2,776
[illegible]	1915	4,274
[illegible]	1913	4,221
[illegible]	1912	4,214
[illegible]	1906	4,785
[illegible]	1910	2,857
[illegible]	1905	3,018
[illegible]	1910	2,925
[illegible]	1904	3,018

It is stated that J. C. Gould & Co. intend to divide the steamers thus acquired between the three companies which they now manage. Including two steamers building, they will now control a fleet of 16 steamers, possessing a total deadweight capacity of considerably over 100,000 tons.

The second transaction is that of the acquisition by W. R. Smith & Son, managing owners of the St. Just Steamship Company, Ltd., from Pyman, Watson & Co., Ltd., managing owners of the London & Northern Steamship Company, Ltd., of their fleet of eight steamers, aggregating about 55,000 tons deadweight. The purchase price has not been disclosed, but it is understood to be between £800,000 and £850,000. The London & Northern Steamship Company, Ltd., was some time ago acquired by Pyman, Watson & Co., Ltd., from Pyman Bros. & Co., Ltd., London. Part of the steamers acquired were previously sold to another Cardiff firm.

The vessels represented are:—

Name.	When built.	Tons gross.
[illegible]	1913	4,221
[illegible]	1913	6,299
[illegible]	1910	4,151
[illegible]	1905	3,042
[illegible]	1904	3,167
[illegible]	1913	4,[illegible]
[illegible]	1905	2,[illegible]
[illegible]	1904	[illegible]

The eight vessels, added to their present fleet, will give W. R. Smith & Son control of 15 steamers, with a deadweight capacity of 115,000 tons, and will put them and J. C. Gould & Co. among the largest shipowning firms of Cardiff.

It should be pointed out that the deal of W. R. Smith & Son differs from that of the purchase of the Hain Steamship Company, Ltd., as it only involves the acquisition of the eight steamers.

It may be added that there are rumours of further transactions in circulation.

Also, Sir W. J. Tatem, Bart., is reported to have recently purchased four additional vessels for the Tatem Steam Navigation Company, Ltd., and it is anticipated that further acquisitions will, in the near future, be announced.

NEWS PARAGRAPHS.

Removal of Offices.—We are notified that the firm of Thompson, Eyres and Bryers, consulting engineers and marine surveyors, late of Baltic Chambers, Sunderland, have removed their head office to Exchange Buildings, Quayside, Newcastle-on-Tyne.

Submarine and Mine Losses.—The number of ships sunk by submarines and mines in the period from the end of February to the end of October, inclusive, was 1,052. This figures was given by Dr. Macnamara, the Secretary to the Admiralty, in the House of Commons.

Thanks of Parliament. Both the Mercantile Marine Service Association and the Imperial Merchant Service Guild have received from the Board of Trade copies of the resolutions of thanks passed by both Houses of Parliament on October 29, together with a request that these bodies will take steps to communicate same to their members.

Higher Wages Applications.—The Committee on Production yesterday heard applications for an advance of 100 per cent. in wages above pre-war rates from workmen employed in Bristol Channel ports. The question of working hours was also raised by ironfounders from Cardiff and Barry Docks, who asked that they should start work at 7 o'clock instead of 6. The decision of the Committee will be communicated to the parties in a few days.

Skippers' War Earnings.—Captain Leng, acting chief officer to the North-Eastern Sea Fisheries Committee, states in his quarterly report that the skippers are paid a percentage of the value of their catch, and the average is about 10 per cent. One Hull skipper is known to have earned over £25,000 since the war broke out, and another £15,000 in two years. The skippers, he adds, have earned all they have received when the perils of the North Sea are remembered.

Rushbrooke Docks, Queenstown.—Furness, Withy & Co., of West Hartlepool, have just purchased Rushbrooke Docks, at Queenstown, from Johnson & Perrott, of Cork. The Rushbrooke graving dock is 435 ft. long and is capable of extension. The dock property is situate in the Queenstown Urban District, and the purchase is regarded as marking a new era of prosperity in the south of Ireland. In the past the south of Ireland has suffered more or less from the absence of industrial enterprise.

Insurance Liability on Missing Ships.—It is understood that there is now every prospect of the various authorities concerned formally approving the terms of an agreement providing for arbitration in the case of missing vessels, and of the scheme being put into operation at an early date. The scheme will obviate the delays such as have occurred hitherto in the settlement of claims for ships and cargoes sunk, owing to the impossibility of securing direct evidence as to whether the vessels were lost through war or marine perils.

Institution of Civil Engineers.—The Council have made the following awards for papers published in the proceedings without discussion during the Session 1916-17:—A Watt gold medal to Major H. S. B. Whitley, R.E. (Neath); Telford premiums to W. C. Popplewell (Manchester), Herbert Carrington (Woodley, Stockport), Dr. A. A. Stoddard (Bournemouth), A. E. L. Chorlton, C.B.E. (Lincoln), and B. L. Samuelson (Rangoon); the Manby premium to R. Bleazby (Perth, W.A.); the Webb prize to J. B. Ball (London); the Howard Quinquennial prize to Dr. W. C. Unwin, F.R.S.

National Shipbuilding Yards.—In the House of Commons on Monday, Mr. G. Terrell put a question to the Secretary of the Admiralty, asking particulars as to the cost of the proposed new national shipbuilding yards. Dr. Macnamara, in reply, said: The construction of National Shipyards was approved by the War Cabinet, and definite action was taken forthwith. Estimates of the probable cost were put in hand, and are now under consideration, but it is not yet possible to give the estimated cost of the whole undertaking, as the details are not yet settled, and the cost of land and of compensation is still under consideration. Mr. G. Lambert then asked whether it was not an extraordinary development that the War Cabinet might sanction the establishment of the new shipbuilding yards without the previous approval of Parliament. Dr. Macnamara, in reply, referred to the necessity of making up the losses caused by the enemy submarines as rapidly as possible, and said that obviously the Government must short-circuit some of the traditional methods of peace, in order to get on as fast as possible.

Ships for Italy.—The United States Shipping Board has agreed to charter to Italy approximately 25 steel ships aggregating 100,000 tons deadweight, which the American Government has commandeered.

Port of London Authority.—The Board of Trade has notified the Port of London Authority that a Bill will be introduced into Parliament again postponing local elections, and that on the passage of the measure the Board will postpone the election and appointment of members of the Port Authority which was due to take place in March, 1918.

Poplar Hospital for Accidents.—On the kind invitation of the Drapers' Company, a meeting will be held at the Drapers' Hall on Thursday, December 6, at 4.45 p.m., in furtherance of the work of the Poplar Hospital for Accidents. Mr. Alderman Domoney, L.C.C., will preside, and he will be supported by Viscount Knutsford, the Rt. Hon. Will Crooks, M.P., and Mr. Alfred Yeo, M.P.

Powers of the Shipping Controller.—An extremely important case, bearing on the extent of the Shipping Controller's powers, has this week been before Mr. Justice Bailhache in the King's Bench Division. The plaintiffs are the China Mutual Steam Navigation Company, Limited, and the point which is raised is whether requisition of ships by the Government is valid when it is made, not for the direct use of the Government, but for the purpose of running the vessels on the account of the Government, so that any profits made on the voyage of the ships should belong to the Government.

Wages of Government Dockyard Workers.—Dr. T. J. Macnamara, Financial Secretary to the Admiralty, received at the House of Commons on October 6 a deputation representing employees in the Government dockyards, with whom he discussed a demand which had been advanced for a 12½ per cent. increase in wages above existing rates of pay. At the close of the interview, which was private, a member of the deputation said that Dr. Macnamara had received them sympathetically, and that negotiations were in progress by which it was confidently hoped a satisfactory settlement would be reached.

Great Lake Steamers for the Atlantic.—In order to cope with the great demand for steamers to handle the traffic between Canada, the United States and British and European ports, the Canadian Department of Marine and Fisheries is collaborating with the United States Shipping Board in transferring boats, formerly plying on the Great Lakes, to the overseas routes. A representative of the United States Shipping Board has been in conference with officials of the Department, and arrangements have been made for the transfer of a number of United States steamers now on the Great Lakes to the Atlantic service. These vessels, when too large to pass through the canals, will be cut in two and docked at Montreal. There they will be put together again for the voyage to an Atlantic port. The Marine Department at Ottawa has been making arrangements whereby a number of boats on the Great Lakes will be put on the Atlantic routes before the close of lake navigation.

Wages of General Workers.—A deputation from the Federation of General Workers, including Mr. J. N. Bell, J.P. (President), and Mr. J. O'Grady, J.P., M.P. (Secretary), presented to the Ministry of Munitions on November 10 the claim of the General Workers in engineering and foundry trades for an advance of 12½ per cent. in wages. The following Unions were represented:—Workers' Union; Gas, Municipal and General Workers' Union; National Amalgamated Union of Labour; Dock, Wharf, Riverside and General Labourers' Union; National Union of Gas Workers; Navvies' and General Labourers' Union; National Union of Enginemen and Cranemen; and National Union of Vehicle Workers. The following announcement was issued after the meeting:—"The matter of the claim of General Workers in Engineering and Foundry Trades for an advance of 12½ per cent. in wages is under consideration by a representative Committee of the Trade Unions concerned and the Ministry of Munitions, together with other Government Departments interested, with a view of placing the whole question before the War Cabinet for their early decision. In these circumstances the representative Committee of the Trade Unions appeal to their members to remain at work pending the decision of the War Cabinet."

OFFICIAL NOTICES AND SHIPS FOR SALE.

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"SHIPBUILDING AND SHIPPING RECORD" TABLE OF SHIP SALES.

Name and Type.	Tonnage.	Dimensions. Draught in ( ).	Sold by, to	Builders, hull and year	Machinery and builders.	Remarks.
Galatea, ss. (single dk.)	1,151 gr. 671 net	228½′ × 35½′ × 15′	Akties. Dampsk. "Galatea," Bergen, to R. Mason, Newcastle	Laxevaags Maskin & Jernskibsbyggeri, Bergen (1912)	16, 25½, 43 × 30 (Laxevaags Maskin & Jernskibsbyggeri)	—
Leelite, ss. (single dk.) (ex *Ensign*)	404 gr. 154 net 385 d.w.	155½′ × 23′ × 10½′ (11′ 4″)	North-Eastern Shipping Co., Dundee, to Mr. Matthew Taylor, Methil	T. B. Seath & Co., Glasgow (1882)	16, 34 × 28 (J. & T. Young, Ayr)	—
Sonora, ss. ..	1,862 gr. 1,186 net 2,900 d.w.	274½′ × 39½′ × 19½′ (18′ 5″)	Cia. Mexicana de Nav., S.A., Vera Cruz, to Mr. F. Lecouevre, Havre	W. Hamilton & Co., Pt. Glasgow (1905)	18, 29, 48 × 33 (D. Rowan & Co., Glasgow)	Price about £150,000.
Tarbetness, ss. (single dk.) (ex *Kingtor*)	3,018 gr. 1,936 net 5,400 d.w.	330½′ × 48′ × 21½′ (21′ 1″)	Fargrove Steam Nav. Co., London, to J. C. Gould & Co., Cardiff	Irvine's S.B. & D.D. Co., W. Hartlepool (1904)	23½, 39, 64 × 42 (Blair & Co., Stockton)	—
Arosa, ss. (single dk.)	2,776 gr. 1,759 net 5,100 d.w.	331′ × 47½′ × 20′ (20′ 1″)	Fargrove Steam Nav. Co., London, to J. C. Gould & Co., Cardiff	Richardson, Duck & Co., Stockton (1905)	23, 38, 62½ × 42 (Blair & Co., Stockton)	
Lundy, ss. (single dk.)	2,857 gr. 1,779 net 5,250 d.w.	331½′ × 47½′ × 20½′ (20′ 8″)	Fargrove Steam Nav. Co., London, to J. C. Gould & Co., Cardiff	Richardson, Duck & Co., Stockton (1910)	24, 40, 65 × 42 (Blair & Co., Stockton)	
Rockabill, ss. (single dk.) (ex *Blacktor*)	3,018 gr. 1,932 net 5,250 d.w.	330′ × 46′ × 22′ (21′ 2″)	Fargrove Steam Nav. Co., London, to J. C. Gould & Co., Cardiff	Ropner & Son, Stockton (1905)	23½, 39, 64 × 42 (Blair & Co., Stockton)	
Eddystone, ss. (single dk.)	4,214 gr. 2,614 net 7,500 d.w.	380′ × 51′ × 24½′ (23′ 8″)	Fargrove Steam Nav. Co., London, to J. C. Gould & Co., Cardiff	Richardson, Duck & Co., Stockton (1912)	26, 42, 70 × 48 (Blair & Co., Stockton)	Price about £900,000.
Caldy, ss. (single dk.)	4,221 gr. 2,619 net 7,500 d.w.	380′ × 51′ × 24½′ (23′ 8″)	Fargrove Steam Nav. Co., London, to J. C. Gould & Co., Cardiff	Richardson, Duck & Co., Stockton (1913)	26, 42, 70 × 48 (Blair & Co., Stockton)	
Beachy Head, ss. (single dk.)	4,274 gr. 2,602 net 7,500 d.w.	380′ × 51′ × 24½′ (23′ 9″)	Fargrove Steam Nav. Co., London, to J. C. Gould & Co., Cardiff	Richardson, Duck & Co., Stockton (1915)	26, 42, 70 × 48 (Blair & Co., Stockton)	
Hartland, ss. (single dk.)	4,785 gr. 3,050 net 8,000 d.w.	369½′ × 50½′ × 27½′ (24′ 9″)	Fargrove Steam Nav. Co., London, to J. C. Gould & Co., Cardiff	Richardson, Duck & Co., Stockton (1906)	26, 42, 70 × 48 (Blair & Co., Stockton)	
Sterndale, ss. (single dk.)	2,925 gr. 1,808 net 5,250 d.w.	331′ × 47½′ × 20½′ (20′ 7″)	Fargrove Steam Nav. Co., London, to J. C. Gould & Co., Cardiff	Richardson, Duck & Co., Stockton (1910)	24, 40, 65 × 42 (Blair & Co., Stockton)	
Cloughton, ss. (single dk.)	4,221 gr. 2,602 net 7,500 d.w.	396½′ × 53½′ × 23′ (23′ 1″)	Pyman, Watson & Co., London, to W. R. Smith & Son, Cardiff	Richardson, Duck & Co., Stockton (1911)	26, 42½, 70 × 48 (Blair & Co., Stockton)	
Dalcham, ss. (single dk.)	4,809 gr. 2,873 net 9,030 d.w.	411½′ × 55′ × 24½′ (25′ 5″)	Pyman, Watson & Co., London, to W. R. Smith & Son, Cardiff	Richardson, Duck & Co., Stockton (1913)	27, 44½, 73 × 54 (Blair & Co., Stockton)	
Escrick, ss. (single dk.)	4,151 gr. 2,581 net 7,500 d.w.	384′ × 53½′ × 23′ (23′ 1″)	Pyman, Watson & Co., London, to W. R. Smith & Son, Cardiff	W. Gray & Co., W. Hartlepool (1910)	25, 41, 68 × 48 (Cen. Mar. Eng. Wks., W. Hartlepool)	
Fallodon, ss. (single dk.)	3,012 gr. 1,914 net 5,234 d.w.	339′ × 48′ × 22′ (21′ 7″)	Pyman, Watson & Co., London, to W. R. Smith & Son, Cardiff	Bartram & Sons, Sunderland (1903)	24, 38, 64 × 42 (J. Dickinson & Sons, Sunderland)	
Langholm, ss. (shelter dk.)	4,167 gr. 2,590 net 7,500 d.w.	383½′ × 53½′ × 23′ (23′ 1″)	Pyman, Watson & Co., London, to W. R. Smith & Son, Cardiff	W. Gray & Co., W. Hartlepool (1911)	25, 41, 68 × 48 (Cen. Mar. Eng. Wks., W. Hartlepool)	Price about £900,000.
Normanby, ss. (shelter dk.)	4,219 gr. 2,598 net 7,500 d.w.	397′ × 53½′ × 23′ (23′ 1″)	Pyman, Watson & Co., London, to W. R. Smith & Son, Cardiff	W. Gray & Co., W. Hartlepool (1911)	26, 42, 70 × 48 (Cen. Mar. Eng. Wks., W. Hartlepool)	
Runswick, ss. (single dk.)	3,060 gr. 1,940 net 5,300 d.w.	340′ × 49′ × 22′ (21′ 6″)	Pyman, Watson & Co., London, to W. R. Smith & Son, Cardiff	W. Gray & Co., W. Hartlepool (1904)	24, 38, 64 × 42 (Cen. Mar. Eng. Wks., W. Hartlepool)	
Quarrydene, ss. (single dk.)	2,883 gr. 1,822 net 5,125 d.w.	331′ × 48′ × 21½′ (21′ 3″)	Pyman, Watson & Co., London, to W. R. Smith & Son, Cardiff	Bartram & Sons, Sunderland (1905)	23½, 39, 64 × 42 (Blair & Co., Stockton)	

SHIPPING SHARE MARKET.

The stock and share markets have been very strong during the past week with considerable business in all the active issues. The Peninsular and Oriental dividend on the deferred ordinary at the same rate as for the previous year (making a total distribution of 18 per cent. for the financial year ended September 30) attracted purchasers of the stock, which improved in price. The yield is about 5½ per cent., but holders look for an appreciation in capital value. Owing to the absorption of the Union Steamship of New Zealand during the past year and the increase in the ordinary capital the amount required for the dividend was about £223,000 more than last year, and a big increase is therefore expected to be disclosed in the accounts. The Royal Mail dividend is at the rate of 4 per cent. per annum for the half-year, being the same as for the two previous years. The largest business in the market has, however, been in the smaller priced shares, such as Court Lines, Prince Lines, Khedivial Mails, and Cunard shares. In the last-named shares the week-end witnessed quite a rush to buy shares, and although the Mayoral show was attracting attention from business over 16 bargains were put through in the shares at about 80s. Some doubt was expressed on the London market whether the offer of £80 per share for the Hain Steamship Company was not an error, as it is known that on the Friday previous to the deal being announced one bargain had been marked at only 34½, giving a profit to the fortunate buyer of about 140 per cent. within twenty-four hours. Under these circumstances it is not surprising to find that brokers have several orders for shares in different companies, such as Sutherlands, Moor Lines, &c., which they find they cannot execute because holders are loth to part with their shares. Shipbuilding companies' issues have also shared in the general appreciation, Swan Hunters having advanced to 46s. 6d. and Hawthorn Leslies to 25, whilst the Palmer issues are being bought by small investors for a rise in price. Whatever other markets may think of the war situation and investment prospects, it is certain that a very optimistic view is taken of the outlook in the shipping market.

SHIPPING, SHIPBUILDING, ENGINEERING AND MARINE INSURANCE SHARE LIST.

SHIPPING.

Name.	Share and paid.	Extreme quotations, 1916.	Last ann. div. % or per share.	Yield. %	Last Quotation	Rise or Fall.
	£					
African S.S.	20	33—23½	10	6⅔	29	
Allan Line ... ... Deb.	100	—	4	4⅔	92	
Anchor Line ... Cum. pref.	10	9⅛—9⅛	5⅛	5⅛	9⅛	
Do. ... ... Deb.	Stk.	105⅛—102⅛	4⅛	4⅛	103	
Argentine Nav. ... Cum. pref.	1	19/6—11/-	Nil.	Nil.	23/4½	— -/4½
Do. ... ... Ord.	1	14/6—5/6	Nil.	Nil.	17/3	+ -/3
Australasian Un. S. Nav. Deb.	Stk.	83⅛—80⅛	4	5	80	
Belfast Steam ... ... "A."	10 (5pd.)	—	5	5	5	
British & African Nav. ... Deb.	Stk.	96½—91	4½	4½	102	
British India Nav. ... Deb.	Stk.	94⅞—88½	4½	5⅛	83⅛	
British S.S. Invest. Trust Def.	Stk.	35⅞—190	30*	8½	355	
Do. ... ... Pref.	Stk.	108—105½	6	5⅞	104	
Do. ... ... Deb.	Stk.	79—77⅛	4½	6⅛	74	
Cairn Line ... ... Deb.	Bds.	99—88	5	5⅛	90⅜—91	
Do. ... ... Ord.	1		20†	9⅛	44 4/4xd	
Clan Line ... ... Ord.	10	32½—22½	25	8⅓	39	+ 9
Court Line ... ... Ord.	£1	42/—26/-	20	13⅓	39/7½	— 1/7½
Cunard SS. ... ... Ord.	1	101/—68/-	20*	5½	80/9	+ 5/9
Do. ... Cum. pref.	Stk.	95—89	5	5⅛	85	
Do. ... ... Deb.	Stk.	99½—93⅞	4⅛	4⅛	99⅛	
Elder Line ... ... Deb.	Stk.	97⅛—89⅛	4⅛	4⅛	103	
Elder Dempster ... Cum. pref.	1	20/6—18/1⅛	5⅛	6⅛	18/6	— -/1⅛
Do. ... ... Deb.	Stk.	92⅛—88⅛	5	5⅔	87	
Ellerman Lines ... Pref. Ord.	10	9¹⅛—9⅛	6⅛	6⅔	9⅛	
Do. ... Guar. pref.	10	9⅛—8⅛	4⅓	5⅓	9⅛	+ 1⅛
France Fenwick ... Cum. pref.	5	98/5—92/6	5⅛	6⅓	87/6	
Furness, Withy ... Ord.	1	61/3—34/3	20*	9⅛	53/9	+ -/6
Do. ... Cum. pref.	10	91—71	5	5⅔	8⅛	— ⅛
General Steam Nav. ...	7⅛	12⅞—8⅛	15	7⅛	22/6	
Do. ... ... Pref.	8	7⅞—6⅜	6	7⅛	16/-	
Houlder Line ... Cum. pref.	5	83/9—67/6	5⅛	6⅓	80/-	
Do. ... ... Deb.	Stk.	—	4⅛	4⅛	93	
Houlder Bros. ... Cum. pref.	5	—	5⅛	6⅛	4	
Do. ... ... Deb.	Stk.	—	4⅛	5⅛	82	
India Gen. Nav. & Rly. ... Ord.	10	12—8⅞	6	5⅔	10⅜	
Indo-China N. ... Pref. Ord.	5	5⅞—90/-	6	6⅔	90/-	
Irrawaddy Flotilla ...	40	—	15	5⅛	116	
Khedivial Mail ... ... Ord.	1	37/—10/-	25	13⅔	37/3	+ 2/9
Do. ... ... Pref.	5	77/6—60/6	5⅛	7⅓	72/6	
Do. ... ... Deb.	Stk.	94⅞—87⅛	4⅛	4⅛	95	
King Line ... ... Ord.	1	—	16*	9⅛	39/9	+ 1/9
Lamport & Holt ... Cum. pref.	£1	20/9—18/9	6	6	19/4½	
Leyland (F.) ... Cum. pref.	10	8⅛—7⅛	40	6⅔	7⅛	
Mercantile SS. ... ... Ord.	5	18—12	40	13	20	+ 5
Do. ... ... Pref.	1	20/1⅛—20/-	5	6⅓	15/-	
Moor Line ... ... Ord.	10	—	30	13⅓	22½	
Nelson Steam Nav. ... Deb.	100	98⅞—97½	5	5⅛	98⅛	
New Zealand ... ... Ord.	£10	—	8	2½	32½	
Do. ... ... Deb.	Stk.	90⅞—88	4	4⅛	89	
Nitrate Producers SS. ... Ord.	5	28½—18	30	6⅔	25	
Do. ... Cum. pref.	5	—	5	5⅛	5	
Oceanic Steam. Nav. ... Deb.	100	99—95⅞	4⅛	4⅛	96	
Orient.Stm.Nav.Co. Cum. pref.	10	9⅜—9⅛	5	5⅛	9	
Do. ... ... Deb.	100	98—91⅞	4⅛	5⅛	89	
P. & O. S. N. ... Cum. pref.	100	100—91	5	5⅛	92⅛	+ ⅛
Do. ... ... Def.	100	349—270	18	5⅛	331	+ 4⅛
Do. ... ... Deb.	Stk.	71—69	3⅛	5⅓	68⅞	
Prince Line		95/—28/-	30	7⅛	98/1⅛	
R.M.S.P. ... ... Ord.	100	134⅛—97⅛	7	6⅛	113⅛	+ 1⅛
Do. ... ... Pref.	Stk.	86⅛—76⅛	5	6⅛	81⅛	+ ⅛
Do. ... ... Deb.	Stk.	89—86	4⅛	5⅛	86	
Shaw, Savill & Alb. Cum. pref.	5	95/—88/3	5⅛	5⅔	85/-	
Shell Transport ... ... Ord.	1	6—4⅛	35	5⅛	5⅛	
Do. ... Cum. pref.	10	10⅛—9	5	5⅛	9	
Sutherland SS. Co. ...	£1	69/6—41/6	30	10	51/3	
Union-Castle SS. Cum. pref.	10	7⅛—7	4⅛	6	7⅛	
Do. ... ... Deb.	Stk.	92⅜—86⅛	4	4⅛	87⅛	
West Hartlepool ... ... Pref.	10	8⅛—7⅛	5⅛	7⅛	7⅛	

INSURANCE.

Alliance	20 (2'4 pd.)	10⅛—8⅞	12/-	7	9⅛	
Indem. Mutual Marine	15 (3 pd.)	13⅛—9⅛	15/-	5	20⅛	
London Assurance	25 (12½ pd.)	52⅛—42½	20	6	58	
Marine Insurance	25 (15 pd.)	39⅛—33⅛	45/-	6	55⅛	
Merchants' Marine Insurance ...	10 (2½ pd.)	7⅛—71/3	10	6	9⅛	
N. British & Mercantile Ord.	25 (6¼ pd.)	34⅛—29	40/-	6⅔	34⅛	
Phœnix Assurance	10 (1 pd.)	7⅛—5⅛	40	7	7⅛	— ⅛
Reliance Marine	10 (2 pd.)	—	20	4⅛	7⅛	
Royal Exchange Assurance ...	Stk.	189⅛—181	10	5⅓	230⅛	
Sea Insurance	10 (2 pd.)	19⅛—19⅛	10	6	27	
World Marine, Limited ...	5 (2 pd.)	61/3—35/-	3	4⅛	6⅛	

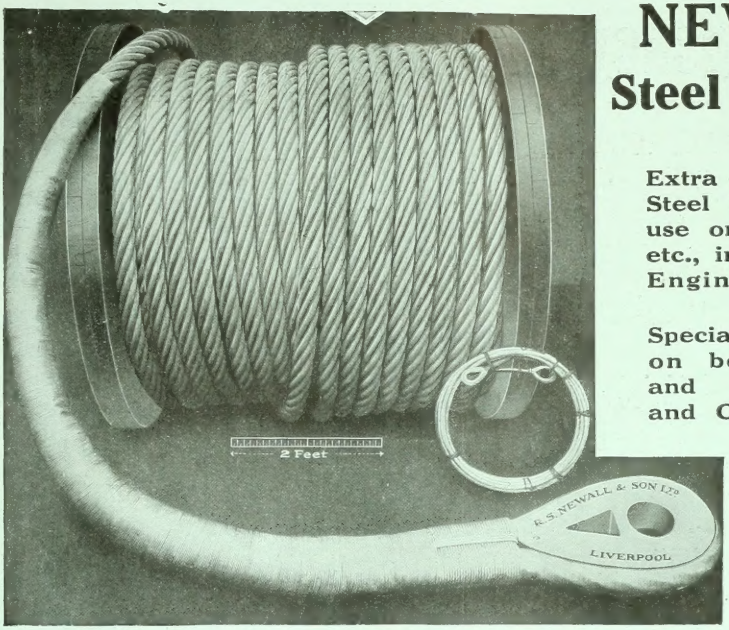
* Including bonus. † Also 20 % in shares. ‡ Treasury price.

IRON AND STEEL.

Name.	Share and paid.	Extreme quotations, 1916.	Last ann. div. % or per share.	Yield. %	Last Quotation	Rise or Fall.
	£					
Babcock & Wilcox ... ... Ord.	1	64/6-47/10½	15	4⅔	61/6	—1/-
Baldwins ... ... Cum. pref.	1	1⅛—1	5⅛	5⅛	19/9	
Do. ... ... Deb.	Stk.	87⅛—86⅛	4⅛	5⅛	84	
Bayliss, Jones ... Cum. pref.	1	—	5	7⅛	1⅛	
Bell Bros. ... ... Cum. pref.	10	10⅛—9⅛	8	6⅔	9⅛	
Do. ... ... Deb.	Stk.	80—78⅛	5	6⅛	75⅛	
Bessemer (Henry) ... Ord.	1	29/—26/-	12⅛	8⅓	29/9	
Bolckow Vaughan ... Ord.	1	25/10⅛-18/-	11	8	27/-	
Do. ... Cum. pref.	20	1⅛—18	5	5⅛	17	
Cargo Fleet Iron ... ... Ord.	1	23/3-13/10½	3	3⅛	23/-	+ -/6
Do. ... ... Deb.	100	86½—84	4⅛	5⅛	83	
Consett Iron Co. ... ... Ord.	1	89/4½—65/3	50	11⅓	89/6	
Dominion Iron & Steel	Bds.	83—78	5	6⅔	76	
Dorman, Long ... ... Ord.	1	36/—22/3	14	9	44/6	+1/8
Do. ... ... Deb.	Stk.	97⅛—97	4	5⅛	73	
Ebbw Vale Steel & Iron Ord.	1	28/7⅛—19/-	12⅛	9⅔	28/-	+ -/9
Guest, Keen & Nttefids Ord.	1	71/3 - 60/-	15*	3⅛	84/6	+4/6
Do. ... ... Cum. pref.	5	5⅛—5⅛	5	4⅛	5⅛	
Do. ... ... Deb.	Stk.	82⅛—80⅛	4	5⅛	79	
Hadfield's Steel Foundry Ord.	1	82/6 - 69/-	30	6	100/6	+ -/6
Dbotson Bros.	5 (4 pd.)	8—6	7⅛	4⅛	6⅛	
Jessop (W.) & Sons ... Ord.	5 (4 pd.)	9—8	15*	7⅛	9	
Lanarkshire Steel Cum. pref.	10	—	5	7⅛	7	
Lysaght (J.) ... Cum. pref.	1	22/7⅛—20/3	6	6	20/-	
Do. ... ... 2nd pref.	1	21/1⅛—21/-	6	6	20/-	
Manganese Bronze ... Ord.	1	—	6	11	1⅛	
Do. ... ... Cum. pref.	1	—	6	8	⅛	
North-Eastern Steel ... Deb.	Stk.	—	4⅛	—	—	
Palmers Ship & Iron "A" ...	1	12/6—9/-	Nil.	Nil.	10/9	
Scott (Walter) ... ... Ord.	1	26/3—17/9	15	12	25/-	
Do. ... ... Pref.	1	16/10⅛—16/3	6	7⅔	19/-	
Sheffield Forge ... ... Ord.	1	—	15	7⅛	69/-	
Shelton Iron & Steel ... Ord.	1	20/4⅛—15/-	7⅛	8⅔	21/6	+ -/6
Do. ... ... Deb.	100	94—92⅛	5	5⅛	91⅛	
S. Durham Steel & Iron Ord.	1	37/6—27/-	15	6⅔	40/3	
Do. ... ... Cum. pref.	1	21—20/-	6	6⅔	20/-	
Do. ... ... Deb.	Stk.	82—80	4⅛	5⅛	80	
Steel Co. of Scotland ... Ord.	10	—	10	10	12/1/-	
Stewarts & Lloyds Pref. ord.	10	18⅛—17	10	6⅓	16	
Do. ... ... Cum. pref.	10	—	6	4⅛	13½	
Stone (J.) ... ... Cum. pref.	10	—	5	6⅔	8	
United States Steel ... ... Ord.	100$	144⅞—83⅛	8	7⅛	107⅛	
Do. ... ... Cum. pref.	100$	128⅛—112⅛	7	6⅓	118⅛	
Vickers Ltd. ... ... Ord.	1	40/3—33/6	12⅛	6⅔	39/6⅔	+ -/6⅔
Do. ... ... Pref.	Stk.	93—85	5	6	81	—2
Do. ... ... Deb.	Stk.	83 75	4	5⅛	79	
Weardale Steel ... Def. ord.	1	34/- -19/1⅛	19⅛	13⅓	30/6	+ -/6
Do. ... ... Cum. pref.	1	23/6 —17/6	6	5	24/-	
Do. ... ... Deb.	Stk.	70⅛—69⅛	4	6	63	
Workington Iron & Steel Ord.	1	24/3—14/3	10	7⅛	27/4⅓	+1/4½

SHIPBUILDING AND MARINE ENGINEERING.

Armstrong, Whitworth Ord.	1	43/—34/6	12⅛	7	39/10⅛	+ -/4
Do. ... ... Cum. pref.	5	75/—67/6	4	5⅔	69/-	
Do. ... ... Deb.	Stk.	80⅛—75	5	6⅔	77	
Beardmore (W.) ... ... Deb.	100	99—92	4⅛	5	91	
Brown (John) ... ... Ord.	1 (1Ss. pd.)	27/3—20/6	12⅛	8⅔	27/6	+ -/6
Do. ... ... Cum. pref.	10	10—5⅛	5	5⅓	8⅛	
Cammell Laird ... ... Ord.	8	7—98/-	15	8	6⅛	
Do. ... ... Cum. pref.	5	88/—76/3	5	6⅔	82/6	
Do. ... ... Deb.	100	93⅛—85	4⅛	5⅛	81	
Dunlop (Jas.) ... ... Ord.	1	19/7⅛-13/4⅛	10	10⅛	19/-	+ -/6
Do. ... ... Cum. pref.	1	17/1⅛-16/4⅛	6	7⅛	17/6	
Fairfield Shipbldg Cum. pref.	10	8⅛—8⅞	6	7⅛	8⅛	
Fleming & Ferguson ... Ord.	10	—	10	7	14⅛	
Gray (Wm.) ... ... Deb.	100	100⅛—99⅛	4⅛	4⅛	100¼	
Hawthorn (R. & W.) Leslie Ord.	10	15⅛—14	12⅛	5⅝	23	
Henderson (D. & W.) Cum. pref.	1	—	5	9	⅝	
Richardsons Westgarth Ord.	1	7/9—2/10½	Nil.	Nil.	6/4⅛	
Do. ... ... Cum. pref	1	15/7⅛—8/-	Nil.	Nil.	15/6	— -/9
Do. ... ... Deb.	Stk.	69—67⅛	4⅛	6⅛	65	
Simons (W.) ... ... Cum. pref.	10	—	5	5	9⅛	
Swan, Hunter & W. R. ... Ord.	1	35/6—26/-	12⅛	6⅓	46/-	+ 2/-
Do. ... ... Cum. pref.	1	18/9—17/-	5	5⅛	17/-	
Do. ... ... Deb.	Stk.	82—80⅛	4⅛	5⅛	78	
Thornycroft (John I.) ... Ord.	1	38/9—21/9	17⅛	8⅓	38/9	+1/-
Do. ... ... Cum. pref	1	18/6—16/3	6	6⅔	17/6	
Do. ... ... Deb.	100	95⅛—88	5	5⅛	83⅛	+1⅛
Wallsend Slipway ... ... Ord.	1	2—1⅛	10	5	2	
Do. ... ... Cum. pref.	1	1—1	5	5	1	



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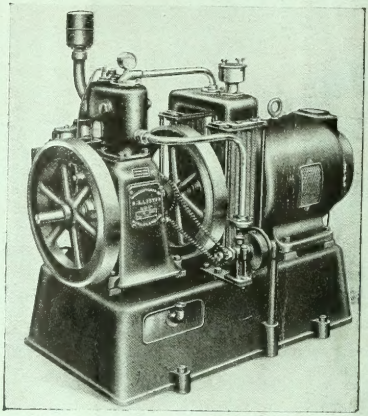

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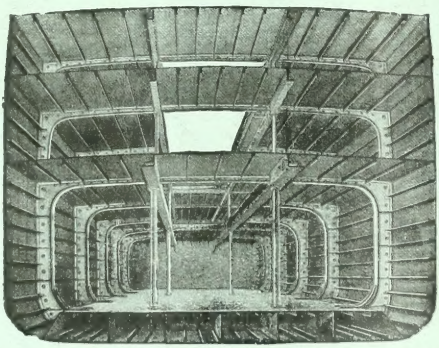

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